INSURANCE DEVELOPMENT IN THE ARAB WORLD : AN ANALYSIS OF THE RELATIONSHIP BETWEEN AVAILABLE DOMESTIC RETENTION CAPACITY AND THE DEMAND FOR INTERNATIONAL REINSURANCE.

By

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ABSTRACT

This thesis is concerned with an examination of the available domestic retention capacity and the demand for international reinsurance in the Arab World. The study has been broken down into the following basic components:

1. The development of the insurance markets of the Arab countries is traced against the background of the economic, political, demographic and other changes, including the growth of demand for insurance, that have occurred in the region over the last few decades.
2. Insurance legislation and supervision, which varies greatly throughout the Arab region, is examined in order to identify the effect it may have on the development of national markets.
3. The market capacity required for the insurance of large risks and natural hazards is analysed, revealing that normal reinsurance arrangements and local retention capacity can absorb only a very small proportion of those risks; and that Arab insurers have a growing need for catastrophe excess of loss reinsurances.
4. The performance of Arab reinsurance companies and pools as a means of improving retention capacity is examined based on data collected from two reinsurance companies and five pools, to demonstrate how retention capacity can be improved.
5. Finally, a theoretical and empirical investigation is conducted into the determination of retention limits. Factors relevant to decisions on fixing retention limits are examined, and

the relationship of company objectives to retention limits and the effect of different forms of reinsurance on the size of retained premium income are discussed.

The study ends with an analysis of the fire, marine cargo and motor reinsurance programmes of two Arab insurance companies to see whether their retention policies are in line with accepted reinsurance practice or whether they could retain more of their business for their own account.

The Arab insurance industry is still in its infancy, with all the attendant inadequacies such a state implies which brings with it two major problems - the inability of retention capacity of local insurers to respond sufficiently rapidly to changes in the economies of Arab countries and the heavy reliance on foreign reinsurance, which in turn leads to low retained premium income. It is hoped that this thesis will have provided an insight into ways in which Arab insurers and reinsurers could themselves meet more of their countries' insurance needs.

THIS THESIS IS DEDICATED TO

MY PARENTS AND MY WIFE

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A.Z.A. ALI

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CHAPTER ONE

BACKGROUND TO THE STUDY

1.1 Introduction

Retention capacity is the most difficult problem facing any insurance market in the developing world, and this study is an attempt to analyse the relationship between available domestic retention capacity and the demand for international reinsurance in the Arab world. The analysis also seeks to determine the behaviour of the Arab insurance market towards a willingness to absorb locally written risks. Furthermore, an integral and important part of the study is to discover how self-sufficient are these markets in reinsurance.

The purpose of this introductory chapter is to summarise the objectives of the study, the methodology used, and its structure; a brief outline of the significance of the study is also provided.

1.2 Significance of the Study

With the development of the economy of the Arab world there has been a concomitant growth in the demand for insurance throughout the region but particularly in the oil producing states. The decade following the oil price rises of 1973 has been a period of rapid economic growth for most Arab countries and both the numbers and sizes of insured risks have increased rapidly. This growth in demand for insurance has been met by increases in both domestic retention capacity and by imports of international reinsurance. The need for

reinsurance protection is considerable. It is larger than in developed countries because of the limited retention capacity of local insurance companies which generally are both relatively small and write highly unbalanced insurance portfolios.

A study of the development of the Arab insurance industry in general and of its retention capacity in particular is of importance for a number of reasons.

First, it provides an insight into the difficulties encountered by many third world countries that are seeking to develop their own insurance industries and to reduce their dependence on foreign insurers.

Secondly, although in the last decade Arab insurance markets have had to cope with an exceptionally rapid increase in demand for insurance, a difficulty they share in common with many other developing countries is the increasing number of large individual risks and the growth of urban and industrial areas exposed to natural hazards. In both cases the potential losses may be several times greater than the total domestic premium income of small countries.

Thirdly, the limited ability of national insurance markets to retain risks locally, and thus their relatively high level of demand for foreign reinsurance, is a matter of concern to Arab and other developing countries. This study will examine in particular the effects of international insurance and reinsurance transactions on countries' balance of payments, and the steps that may be taken to increase local retentions.

Finally, the policies adopted by insurance and reinsurance companies in fixing their retention limits considerably affect not only the balance of payments but also their own security and operating results. Therefore an investigtion into present practices should

be of interest from an insurance supervisory standpoint too.

1.3 Objectives and Methodology

In view of the general characteristics of the insurance industry in the Arab world, and the limited retention capacity available in the region, the need for information relating to those factors affecting the demand for reinsurance is obvious. The issues to be addressed in the study are; will local Arab insurance markets be able to provide sufficient underwriting and retention capacity to meet the substantial development of insurance business? And if not, what will be the magnitude of the demand for international reinsurance, and how can it be reduced?

The study sets out to provide a theoretical and empirical approach to the problem of retention capacity and the demand for foreign reinsurance. It does not attempt to produce a model to serve as a practical aid for determining retention capacity; rather, it seeks to analyse present market capacity trends and suggest some likely developments, in the hope that, with modification and improvement, it might act as a basis for further study of the retention capacity situation.

The key issues of domestic retention capacity dealt with in the study are those of, (a) the restraints imposed on retention capacity, (b) ways of improving retention capacity, and (c) considerations regarding the fixing of retention limits.

These issues are key problems in relation to the demand for reinsurance, as they are the components which determine market per-

formance. Influences on retention capacity include; (a) the capitalisation and number of companies; (b) various restrictions imposed by insurance legislation and supervision; and (c) the degree of expertise possessed by companies. Of these factors, insurance regulations constitute a framework in which the market capacity develops, and it will be demonstrated that inadequate insurance regulations and supervision can adversely affect a market's insurance development. It is also hoped to show that the increase in the number and size of large risks, and the trends towards high values and denser population in areas exposed to natural hazards, place unusual demands on market capacity. The approach employed in the study is, firstly, to describe how insurance legislation and supervision, hazardous and high value risks, and natural hazards have strained market retention capacity, and, secondly, to consider any relevant measures which could provide a solution to this problem.

It will be demonstrated that the establishment of pools and national/regional reinsurance companies are two measures by which substantial increases in retention capacity can be achieved. The Arab pools have failed to work satisfactorily in practice, however, since their membership and underwriting capacity remain very limited relative to the number of companies in the region and size of the risks that require insurance. Unlike the pools, national/regional reinsurers have made significant contributions to increasing domestic retention capacity, and thus reducing their markets' relative dependence on foreign reinsurance.

Central to the question of retention capacity and the demand for reinsurance are the difficulties encountered by insurers in determining their retention limits. It is a universal problem, common to both developed and developing countries. The reason is that

the process of fixing retention limits requires a mixture of analytical and judgemental techniques; it is not a problem amenable to solution solely by using mathematical models. To date no one has been successful in producing a neat actuarial formula capable of taking into account all of the factors which are relavant to the fixing of retention limits, including various policy decisions that have to be taken by top management. Among those decisions are the company's corporate objectives.

As market capacity is the sum of the retention capacity of all companies operating in a market, the importance of the various factors which generally are regarded, from a theoretical standpoint, as being of relevance to decisions on retention limits are examined. Then an attempt is made to establish to what extent the retention policies pursued by Arab companies are related to certain key factors.

The methodology employed for the study comprises the twin methods of theoretical and empirical observations. At each stage of the process, conceptual frameworks are erected to allow a sufficient depth of analysis and interpretation for the further understanding of the nature of retention capacity and the demand for international reinsurance in the Arab world.

Information and data for this study was obtained from a variety of sources. Besides an extensive survey of all relevant literature, including conference and other reports, insurance legislation and administrative directives, original research material was obtained from:

(a) Contacts established during the course of the study, which included personal interviews and correspondence with certain international and Arab insurance and

reinsurance companies, and insurance representatives within the Arab States.

(b) A visit made to Iraq in 1981 to collect data.

(c) A questionnaire sent to 143 insurance and reinsurance companies in the Arab world, and replies were received from 46.

1.4 Chapter Structure

The study is divided into four main parts. Part one, comprising chapters two and three, deals with the economic development of the Arab world and its insurance industries. Chapter two examines the present economic situation and development trends in the Arab States, and also provides an important background to the study of demand for insurance and reinsurance which follows in subsequent chapters. Chapter three concentrates on the growth of Arab insurance markets and their characteristics, structures, and problems. A comparison of insurance development in the Arab World with other developed and developing countries is made in order to give an indication of the importance of the Arab insurance industry. The future of the industry is also examined.

Part Two, comprising chapters four, five, and six, concentrates on a close examination of insurance legislation and supervision as well as examining the demands for underwriting capacity. The main theme of chapter four is related to the statutory regulation of insurance and the scope of legislation; in addition it attempts to provide a clear picture of the effects of insurance regulations on insurance development. The problems of a rapid increase in the number and

size of individual large risks and their impact on the portfolio structure of insurance companies are presented in chapter five. Chapter six examines the magnitude of the problems of natural hazards, and the extent to which towns and development projects in the Arab World are exposed to these hazards. It also seeks to establish the criteria by which natural hazards should be carefully assessed, and why catastrophe cover is necessary for insurance and reinsurance companies.

Part Three, comprising chapters seven and eight, considers the implications raised in Part Two regarding the need for domestic as well as foreign insurance and reinsurance. Chapter seven attempts to evaluate the ability of Arab pools and national/regional reinsurance companies to increase domestic retention capacity. The chapter also examines the main factors which might affect the development of the pools and reinsurance companies, with the objective of assessing their achievements. Chapter eight discusses the effect of international insurance and reinsurance transactions on the balance of payments.

Part Four, comprising chapters nine, ten, eleven, and twelve, deals with the problems of determining a company's retention limits so as to provide a clear picture of the context in which retention capacity and the demand for reinsurance can be evaluated. Chapter nine lists the factors influencing retention limits, and also concentrates on the inter-relationship of these factors and the level of retention. Chapter ten is concerned with the key retention decision areas in relation to company objectives, and a detailed analysis of the implication of prime objectives for retention limits is also provided. Retention limits according to different forms of reinsurance are examined in Chapter eleven, which has the objective of showing

how the different forms of reinsurance affect retained premium income and, consequently, the size of reinsurance premiums ceded. Chapter twelve investigates the relationship between retention limits, net premium income, and shareholders' funds, with the intention of discovering whether or not insurance companies do relate their retention limits to these two variables.

A summary of, and conclusions to, the study are presented in chapter thirteen.

CHAPTER TWO

THE ECONOMIC DEVELOPMENT OF THE ARAB WORLD

2.1 Introduction

Like many other producers, the suppliers of insurance can, to a degree, create a demand for their products through their marketing activities. However, even the most imaginative and aggressive marketing cannot create the risks that can be handled by insurance. Fundamentally, the potential demand for non-life insurance in any country depends on two factors;

(i) the stage of economic development, viz, the numbers and size of buildings, vehicles, aircraft, ships, etc. for which insurance may be required, and

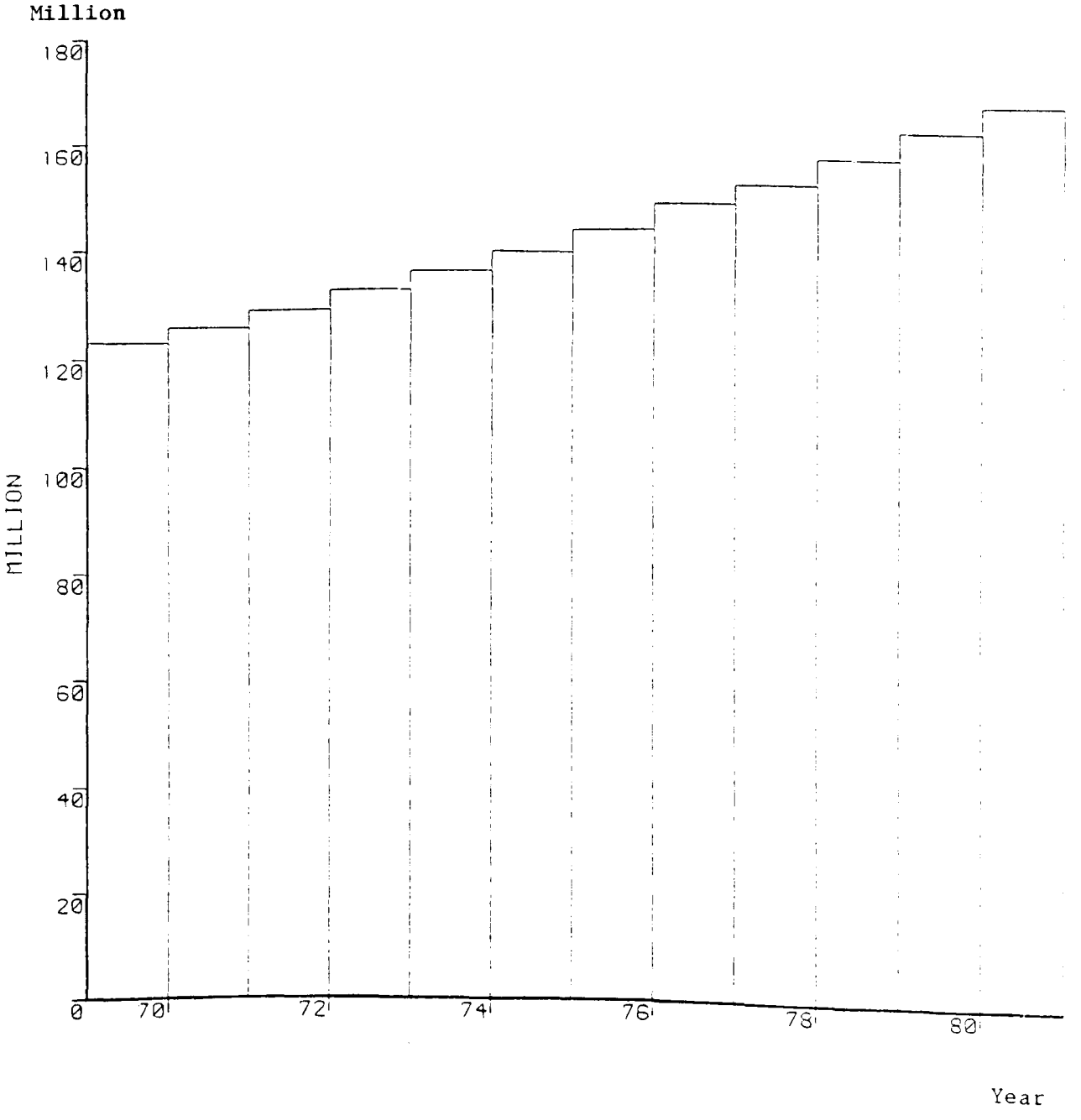
(ii) the levels of real income. Therefore, this chapter will examine the economic development of Arab States before turning to the development of insurance in the Arab World.

2.2 Population

The Arab World in West Asia and North Africa comprises twenty-one countries with an estimated 1981 total population of 168.68 million, an increase of 45½ million since 1970 (see Figure 2.1). Five countries with populations exceeding 10 million (Algeria, Egypt, Iraq, Morocco and Sudan) account for 69 per cent of the total

Figure 2.1

Population of the Arab World (1970-81)



Source: Table 2.1A

population of the area; at the other extreme Bahrain, Oman, Qatar, and U.A.E., each have populations of less than one million.

During the 1970's few countries in the World experienced a rate of population growth as high as that of the Arab region (see table 2.1). Although the annual average growth rates of individual Arab countries varies widely, ranging from 0.8 per cent per annum in war-torn Lebanon up to 11.5 per cent in the United Arab Emirates (see table 2.1A), everywhere in the region population grew faster than in the industrialised countries of the Western World.

Relatively, the largest increases in population occurred in the oil-rich States of the Arabian Gulf, particularly in the small countries, most notably U.A.E. (11.5 per cent p.a.), Qatar (7.7 percent) and Kuwait (6.4 percent),an increase largely due to immigration. However, everywhere factors such as improvements in public health and medical care leading to falling death rates, high birth rates associated with a young population, and improvements in living standards contributed to the growth of population (Morris, 1972, p.391).

Although population density in general is low, it varies considerably between countries. In 1979, the total area of the Arab World was approximately 12,011,622 square kilometres, with an average density ranging from Bahrain's 498 persons per sq.km. to an average density in Mauritania of two persons per sq.km. The establishment of new urban centres in many Arab countries, particularly the oil producing countries, has led to a large drift of population into towns. The major concentrations of population are along the Mediterranean and the valleys of the Nile, Tigris and Euphrates, which combine fertile land with an abundance of water and mild weather.

TABLE 2.1A

The Growth and Density of Population in the Arab World

COUNTRY	Population million, mid-year estimates												Average Annual growth rate 1970-81	Area thousand sq.km.	No.of persons per sq. km as in 1981
	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981			
Algeria	14.33	14.77	15.27	15.77	16.28	16.78	17.30	17.91	17.58	18.19	18.67	19.59	2.9	2382	8
Bahrain	0.22	0.22	0.23	0.24	0.25	0.26	0.27	0.27	0.28	0.29	0.36	0.31	3.2	0.622	498
Dujibouti	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a.	n.a
Egypt	33.33	34.08	34.84	35.62	36.42	37.01	37.87	38.79	39.82	40.98	42.29	43.47	2.4	1001	43
Iraq	9.44	9.75	10.07	10.41	10.77	11.12	11.51	12.03	12.33	12.77	13.07	13.53	3.3	435	31
Jordan	2.30	2.38	2.46	2.54	2.62	2.70	2.78	2.90	3.01	3.13	3.24	3.36	3.5	98	34
Kuwait	0.74	0.79	0.84	0.89	0.94	1.01	1.07	1.14	1.21	1.29	1.37	1.46	6.4	18	81
Lebanon	2.47	2.53	2.60	2.66	2.74	2.77	2.76	2.73	2.69	2.66	2.66	2.69	0.8	10	269
Libya	1.99	2.10	2.14	2.24	2.33	2.43	2.53	2.63	2.74	2.86	2.97	3.10	4.1	111	28
Mauritania	1.25	1.28	1.31	1.35	1.38	1.42	1.46	1.50	1.54	1.59	1.63	1.68	2.7	1031	2
Morocco	15.31	15.38	15.70	16.31	16.80	17.31	17.83	18.36	18.91	19.47	20.05	20.65	2.8	447	46
Oman	0.65	0.68	0.70	0.72	0.74	0.77	0.79	0.81	0.84	0.86	0.89	0.92	3.2	212	4
Qatar	0.11	0.12	0.13	0.15	0.16	0.17	0.19	0.20	0.21	0.23	0.24	0.25	7.7	11	23
S. Arabia	6.20	6.38	6.57	6.76	6.92	7.25	7.58	7.92	8.26	8.61	8.96	9.32	3.8	2150	4
Somalia	2.79	2.86	2.94	3.01	2.97	3.13	3.36	3.66	4.00	4.34	4.64	4.90	5.3	638	8
Sudan	14.09	14.44	14.81	14.96	15.34	15.73	16.13	16.95	17.37	17.86	18.69	18.90	2.7	2506	8
Syria	6.26	6.46	6.68	6.89	7.19	7.44	7.72	8.02	8.33	8.65	8.98	9.31	3.7	185	50
Tunisia	5.13	5.23	5.33	5.44	5.46	5.61	5.77	5.93	6.08	6.24	6.37	6.51	2.2	164	40
UAE	0.23	0.28	0.34	0.42	0.45	0.51	0.56	0.61	0.65	0.69	0.73	0.76	11.5	84	9
Yemen (N)	4.84	4.91	4.99	5.08	5.19	5.28	5.38	5.48	5.58	5.69	5.81	5.94	1.9	195	30
Yemen (S)	1.44	1.47	1.51	1.56	1.63	1.69	1.75	1.80	1.85	1.91	1.97	2.03	3.2	333	6
	123.12	126.11	129.46	133.02	136.58	140.39	144.61	149.64	153.28	158.31	163.59	168.68	2.9	12.011.622	13

Sources: UNITED Nations,Monthly Bulletin of Statistics. Vol.XXXIV, August 1980, for the years 1970-73 and Vol.XXXVII, April 1983 for the years 1974-81.

Bahrain:IMF, International Financial Statistics, Yearbook 1982

Yemen(S): " " " " Yearbook 1981, for the years 1979-81

Area Column: United Nations, Demographic Yearbook (1978), country pages.

The remainder of the region is less fertile, with a substantial portion of uncultivable desert.

Table 2.1

Average Annual Growth of the World's Population

1970-1981

Country Group	Average annual growth of population (percent).
Low-income countries(1)	1.9
Middle-income countries(2)	2.4
High-income countries(3)	4.9
Industrialized countries	0.7
Non-market industrial economies	0.8
Arab World (unweighted)	2.9

Source: (The World Bank, 1983, pp.284-5).

Note: (1) Include two Arab countries.
(2) Include eleven Arab countries.
(3) Four Arab countries only.

2.3 Gross Domestic Product (GDP) and its Growth.

To produce an accurate analysis of economic growth in the region, account must be taken of the sharp increase in crude oil prices in the 1970's. Therefore, the rate of growth in the GDP and GDP per capita at current prices will be broken down into sub-periods to identify the impact of the oil price increase on the Arab states. During the period 1970-1979 the economies of most

of the Arab states witnessed a considerable rate of economic growth; but the year 1973 constitutes a landmark in the economies of the region as a whole, and of the oil producing states in particular.

Measured at current prices, both the gross domestic product (GDP) and the GDP per capita rose sharply in all Arab countries (see table 2.2). For example, in 1980 the GDP of Saudi Arabia was more than 22 times higher than its 1970 level, and in Oman, Syria and Kuwait the 1980 GDP figures were respectively 17.1, 8.1, and 7.8 times greater than for 1970. The average (unweighted) growth of GDP at current prices in local currencies for the whole region for the period 1970 - 1980 was 23.1 per cent p.a. The simultaneous increases in population reduced the average annual growth of GDP per capita to 18.7 per cent (see table 2.3A). Both of those figures are, however, significantly higher than the underlying rate of economic growth due to the inflation that occurred in all of the countries during the 1970's.

After allowing for the inflationary factor by measuring GDP in constant prices, the average annual rate of growth for the region was still above 6 per cent for each of the last two decades (table 2.3A). As shown by table 2.3, during the 1970's the Arab World achieved a far faster rate of economic growth than most of the rest of the world.

Although in general the oil producing states achieved the fastest rates of economic growth in the 1970's, there were exceptions. For example, after its rapid growth in the 1960's the Libyan economy grew at only a modest 2.2 per cent p.a. in the 1970's, whereas the non-oil States of Syria and North Yemen recorded high rates of growth of 10.0 per cent and 9.2 per cent respectively.

Table 2.2

Total GDP and GDP per Capita of the Arab States at Current Prices
(Million - Local Currencies)

Country	Currency	1970		1971		1972		1973		1974		1975		1976		1977		1978		1979		1980	
		GDP	GDP per capita	GDP	GDP per capita	GDP	GDP per capita	GDP	GDP per capita	GDP	GDP per capita	GDP	GDP per capita	GDP	GDP per capita	GDP	GDP per capita	GDP	GDP per capita	GDP	GDP per capita	GDP	GDP per capita
Algeria	A.Din.	22.900	1598	23.500	1591	27.400	1794	32.100	2036	48.500	2979	53.800	3206	64.700	3740	81.900	4573	100.600	5722	120.800	6641	159.00	8516
Bahrain	B.Din.	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a
Dujibouti		n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a
Egypt	E.£	2971	89	3146	92	3417	98	3663	103	4197	155	4886	132	6276	166	7341	189	9782	246	12475	304	16804	397
Iraq	I.Din.	1282.5	136	1465.1	150	1475.0	146	1626.4	156	3378.0	324	4022.4	362	4856.8	422	5788.0	481	n.a	n.a	n.a	n.a	n.a	n.a
Jordan	J.Din.	174.4	76	186.2	78	207.2	84	218.3	86	247.3	94	278.6	103	287.9	104	472.0	163	576.7	191	712.0	227	998.4	308
Kuwait	K.Din.	961	1299	1346	1703	1521	1810	2155	2421	3511	3735	3226	3194	3672	3431	3885	3408	4194	3466	6743	5227	7451	5439
Lebanon	L.£	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a
Libya	L.Din.	1426	717	1627	775	1799	841	2246	1003	3973	1705	3780	1556	4907	1940	5732	2179	5912	2157	7846	2743	n.a	n.a
Mauritania	M.Oug.	9400	7520	n.a	n.a	12342	9421	13043	9661	15917	11534	19139	13478	22824	15633	24337	16224	24988	16225	27807	17489	31728	19465
Morocco	M.Dir.	16.960	1108	18.570	1207	20.150	1283	21.310	1306	26.740	1592	29.890	1727	35.720	2003	43.990	2396	55.31	2924	62.24	3197	70.02	3492
Oman	O.Rial	106.8	164	125.1	184	1 4.8	201	182.6	254	598.5	809	724.2	941	827.0	1047	880.1	1087	896.6	1067	1172.5	1363	1823.3	2049
Qatar	Q.Rial	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a
S. Arabia	S.Rial	17.399	2806	22.921	3593	28.251	4301	40.551	5999	99.315	14352	134.211	18512	157.861	20826	200.751	25347	223.750	27088	249.540	28982	385.81	43059
Somalia	S.Shil.	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a
Sudan	S.£	701.5	50	761.1	53	832.4	56	896.8	60	1246.2	81	1510.8	96	1776.9	110	1865.7	110	2882.7	166	n.a	n.a	n.a	n.a
Syria	S.£	6433	970	7448	1153	8891	1331	9413	1366	14870	2068	19536	2626	23174	3002	26320	3282	32696	3925	39302	4544	52301	5824
Tunisia	T.Din.	758.0	148	887.5	170	1077.6	202	1162.8	214	1527.0	279	1744.2	311	1904.0	330	2137.0	360	2482.0	408	2944.0	472	3471.0	545
U.A.E.	UAE.Dir.	n.a	n.a	n.a	n.a	6.600	19411	11.400	27143	31.100	69111	33.400	65490	43.600	77857	50.300	82459	60.7	93385	80.0	115942	109.8	150411
Yemen (N)	Y(N).Rial.	1746.0	361	2091.0	426	2514.0	504	3260.0	642	4474.0	862	5181.0	981	7545.0	1402	8141.0	1486	8220.0	1473	10166.0	1787	11919.0	2051
Yemen (S)	Y(S).Din.	68.4	48	62.6	43	64.8	43	68.0	44	77.9	48	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a

Source: GDI : IMF, International Financial Statistics, Yearbook 1979, for the period 1970 77, Yearbook 1982 for the years 1978 and 1979, and Yearbook 1983 for the year 1980.
Iraq for 1977: United Nations, World Statistics in brief, 4th ed., 1979.
GDP per capita: calculated by the author.

Note: Figures are in billions for Algeria, Morocco, S. Arabia and U.A.E.
n.a. : not available.

Table 2.3A

Annual Average Growth Rates of GDP and GDP per capita in Local Currencies for the Period (1960-70) and (1970-80)

Country	Average annual growth at current prices		Average annual growth at constant prices		
	GDP	GDP per capita	GDP		GNP per capita
	1970-80	1970-80	1960-70	1970-80	1960-80
	%	%	%	%	%
Algeria	21.4	18.2	4.3	7.0	3.2
Bahrain	n.a	n.a	n.a	n.a	n.a
Dujibouti	n.a	n.a	n.a	n.a	n.a
Egypt	18.9 B1	16.1 B1	4.3	7.4	3.4
Iraq	24.0	19.8	6.1	12.1	5.3
Jordan	19.1	15.0	6.6	7.0 N	5.7
Kuwait	22.7	15.4	5.7	2.5	-1.1
Lebanon	n.a B2	n.a B2	4.9	n.a	n.a
Libya	20.9	16.1	24.4	2.2	5.2
Mauritania	12.9	10.0	8.1	1.7	1.6
Morocco	15.2	12.2	4.4	5.6	2.5
Oman	32.8	28.7	n.a	n.a	n.a
Qatar	n.a	n.a	n.a	n.a	n.a
S. Arabia	36.3	31.4	n.a	10.6	8.1
Somalia	n.a B3	n.a B3	1.0	3.4	n.a
Sudan	19.3	16.2	1.3	4.4	-0.2
Syria	23.3	19.6	4.6	10.0	3.7
Tunisia	16.4 B4	13.9 B4	4.7	7.5	4.8
U.A.E.	42.1	29.2	n.a	n.a	4.3
Yemen (N)	21.1	19.0	n.a	9.2	4.5
Yemen (S)	n.a	n.a	n.a	n.a	12.1
	23.1	18.7	6.2	6.5	4.2

Source: (1) Compiled from table 2.2
(2) Growth rates at constant prices: The World Bank (1982, pp.110-113)

B1: Figures are for 1970-77.
B2: Figures are for 1970-79.
B3: Figures are 1970-78.
B4: Figures are for 1972-80.
N : Figure is for 1970-78.

Note: The Arab oil producers are: Algeria, Iraq, Kuwait, Libya, Oman, Qatar, Saudi Arabia, and U.A.E.

The differences between Arab countries' income per capita are large. Apart from Algeria, the most heavily populated countries (Egypt, Morocco and Sudan) are amongst the poorest countries in terms of GDP per capita. Conversely the highest levels of income per capita occur in the smallest countries in terms of population, e.g. the United Arab Emirates, Kuwait and Saudi Arabia.

Table 2.3

The Growth Rates of the World's GDP at Constant Prices

1970-80

Country Group	Average Annual Growth of GDP (percentage)
Low-income countries (1)	4.6
Middle-income countries (2)	5.6
Industrialized countries	3.2
Non-market Industrial economies	6.4
Arab World (unweighted)	6.5

Source: The World Bank (1982, pp.112-13
Note: Weighted average
(1) Include two Arab countries.
(2) Include nine Arab countries.

To summarise, in general, the oil-producing states have witnessed higher rates of growth in their GDP and GDP per capita than the non-oil producing states. But in respect of GDP per capita too much reliance should not be placed on these figures for two reasons: firstly, the unreliability of the statistics, especially population figures, and secondly, the high degree of inequality in income distribution in the whole region, and in the oil states in particular.

2.4 The Industrial Sector

Certain Arab states have a relatively long history of industrialization, whilst others have only just begun the process. The initial stage of industrialization is related to the processing of primary products, for export; in the case of agricultural commodities, only elementary operations are performed, whilst oil producing states may well begin with refineries and petro-chemical plants. The second stage of the industrialization process is the transformation of raw materials into consumer goods for the local market, (Adams, 1971, pp. 442-43).

During the past decade, the various states of the region have adopted plans for industrial development. Some states have positively sought to diversify their economies to avoid their dependence on one product as a major source of income. Other states have channelled some of their substantial oil revenues into industrial projects largely because of the lack of other opportunities for investment. A considerable rate of growth in industrial and manufactured output has been achieved as a result of these efforts. During the periods 1960-1970 and 1970-1980, industrial production in Arab countries increased at an average annual rate of growth at constant prices (unweighted mean) of 6.3 percent and 5.7 percent respectively, whilst the average annual rates of growth in manufacturing output were 5.7 percent and 7.7 percent for the same periods. The Arab countries, during the period 1970-80, have achieved the second highest rate of growth (after middle income countries) for industry, and the highest rate for manufacturing, (see tables 2.4 and 2.5).

Table 2.4

Average Annual Growth Rate of Agriculture, Industry and Manufacturing Production, and Distribution of GDP (percent)

Country	Agriculture at constant prices		Industry at constant prices		Manufacturing at constant prices		Distribution of GDP : 1980		
	1960-1970	1970-1980	1960-1970	1970-1980	1960-1970	1970-1980	Agriculture	Industry	Manufacturing
	%	%	%	%	%	%	%	%	%
Algeria	0.1	3.1	11.6	7.9	7.8	11.4	6	57	14
Egypt	2.9	2.7 N	5.4	6.8 N	4.8	8.0 N	23	35	28
Iraq	5.7	-1.8 N	4.7	13.6 N	5.9	14.4 N	7	73	6
Jordan	n.a	n.a	n.a	n.a	n.a	n.a	8	32	16
Kuwait	n.a	7.4	n.a	-1.8	n.a	9.2	0	79	6
Lebanon	n.a	6.3	n.a	4.5	n.a	5.0	n.a	n.a	n.a
Libya	n.a	11.1	n.a	-2.3	n.a	18.9	2	72	4
Mauritania	n.a	-1.1	n.a	0	n.a	0.2	26	33	8
Morocco	4.7	0.8	4.2	6.6	4.2	5.8	18	32	17
S. Arabia	n.a	5.3	n.a	10.2	n.a	6.5	1	78	4
Somalia	-0.6	3.0	3.4	-2.6	4.0	-3.8	60	11	7
Sudan	n.a	2.6	n.a	3.1	n.a	1.3	38	14	6
Syria	4.4	8.2	6.3	9.6	5.6	7.9	20	27	21
Tunisia	2.0	4.9	8.2	9.0	7.8	11.2	17	35	13
Yemen (N)	n.a	3.7	n.a	14.7	n.a	12.2	29	16	6
Average	2.7	4.0	6.3	5.7	5.7	7.7	18.2	42.2	11.1

Source: The World Bank (1981, pp. 136-37) and(1982, pp. 112-15).

N: Figures are for 1970-79, not 1970-80.

Table 2.4 also shows that the distribution of industrial production to GDP is higher in oil-producing states than in non-oil producing states, because the oil industry constitutes a large proportion of the industrial sector. In 1980 the share of industrial output at current prices (in local currencies) in the GDP amounted to 79 percent in Kuwait followed by S. Arabia (78 percent), Iraq (73 percent), Libya (72 percent) and Algeria (57 percent). In non-oil producing states, the highest share of industrial production in the GDP was 35 percent in Egypt and Tunisia, and the lowest share was 11 percent in Somalia. In contrast to industry, the contribution of manufacturing output to GDP is higher in non-oil producing states than in oil-producing states for the same year.

Table 2.5

Comparison of Growth of Production for Agriculture, Industry and Manufacturing in Arab Countries With Rest of World at Constant Prices for the Periods, (1960-70) and (1970-80).

Country Group	Average Annual Growth Rate(percent)					
	Agriculture		Industry		Manufacturing	
	1960-1970	1970-1980	1960-1970	1970-1980	1960-1970	1970-1980
Arab countries(per table 4)	2.7	4.0	6.3	5.7	5.7	7.7
Low-income countries (1)	2.2	2.2	7.0	3.6	6.3	3.7
Middle-income countries (2)	3.5	2.9	7.4	6.6	6.8	6.4
Industrialized countries	1.4	1.4	5.9	3.1	5.9	3.2
Centrally planned economies	n.a	n.a	n.a	n.a	n.a	n.a

Source: The World Bank (1982, pp.112-3)
(1) Include: Somalia and Sudan
(2) Include: Egypt, Yemen(N), Yemen(S), Morocco, Syria, Tunisia, Jordan, Lebanon, Iraq, Algeria, and Mauritania.

The rapid growth of the industrial sector in recent years has partly been due to countries of the region having placed industrialization high on the scale of priorities for their development and has led them to expect further rapid growth in the future from this sector. The oil-producing states are witnessing considerable activity in the area of heavy industry, and since 1978 major developments have included:

- The opening of the Saudi Lube-oil refinery.
- The addition of further LNG capacity in Algeria.
- The opening of Kuwait's NGL and LPG plant.
- The opening of Iraq's iron and steel complex.
- The opening of Dubai's massive dry dock and ship repairing facility.

Many other large projects are in operation and under construction. A more detailed picture of the number and investment costs of the principal projects in some Arab countries (Organization of Arab Petroleum Exporting Countries - OAPEC) is given in Table 2.6 which shows the large investment costs of these industrial projects.

Attiga (1982, p.18) has pointed out that, in the major oil exporting states, more than 80 percent of industrial investment is in refining and gas processing, petrochemicals, fertilizers, basic metallurgy and cement. Table 2.7 illustrates the OAPEC investment expenditures of the main industrial projects by sector and by country. The highest share of investments amounts to 33.3 percent of the total investments listed in the following table in Saudi Arabia, while the lowest share was 1.2 percent in Bahrain.(1)

(1) It has been estimated that during the next ten years the value of investments in oil projects throughout the Arab World will amount to U$.100 bn. -120 bn. (Roger,1981,p.III).

Table 2.6

Number and Investment costs of the Main Industrial Projects in some Arab countries at the end of 1981

Type of Projects	Egypt and Syria			Algeria and Iraq			S.Arabia, Libya, Kuwait, U.A.E. Qatar & Bahrain.			Total O.A.P.E.C.		
	No.of projects	Investment Amounts U$ million	%	No.of projects	Investment Amounts U$ million	%	No.of projects	Investment Amounts U$ million	%	No.of projects	Investment Amounts U$ million	%
Refining and Gas processing	80	1825	12.8	17	6700	30.7	23	18713	35.8	120	27238	30.8
Petrochemical and Fertilizer	12	1300	9.1	20	4376	20.0	30	15205	29.1	62	20881	23.6
Basic Metallurgy	3	1957	13.7	2	1130	5.2	9	7403	14.1	14	10490	11.9
Cement	19	1813	12.7	19	2231	10.2	14	2281	4.4	52	6325	7.2
Sub Total	114	6895	48.3	58	14437	66.1	76	43602	83.4	248	64934	73.5
Other Manufacturing	169	7395	51.7	258	7398	33.9	741	8655	16.6	1168	23448	26.5
Total	283	14290	100.0	316	21835	100.0	817	52257	100.0	1416	88382	100.0

Source: ENI, vol. 1, 1981.

Table 2.7

Investment cost of the Principal Industrial Projects by Sector and by Country at the end 1981. (U$ million)

Country	Refining & Gas Processing		Petrochemical & Fertilizers		Basic Metallurgy		Cement		Sub Total		Other Manufacturing		Total OAPEC	
	Amounts	%	Amounts	%	Amounts	%	Amounts	%	Amounts	%	Amounts	%	Amounts	%
Algeria	2500	23.1	1376	12.8	500	4.6	750	6.9	5126	47.4	5675	52.6	10801	100.0
Bahrain	400	38.1	300	28.6	300	28.6	-	-	1000	95.3	50	4.7	1050	100.0
Egypt	1392	12.9	744	6.9	1957	18.1	869	8.1	4962	46.0	5830	54.0	10792	100.0
Iraq	4200	38.1	3000	27.2	630	5.7	1481	13.4	9311	84.4	1723	15.6	11034	100.0
Kuwait	500	38.2	720	55.0	-	-	-	-	1220	93.2	90	6.8	1310	100.0
Libya	1218	10.9	3500	31.4	4150 (1)	37.3	610	5.5	9478	85.1	1656	14.9	11134	100.0
Qatar	850	30.3	1310	46.7	423	15.1	50	1.8	2633	93.9	170	6.1	2803 (2)	100.0
S. Arabia	12495	42.5	8575	29.2	680	2.3	1486	5.0	23236	79.0	6174	21.0	29410	100.0
Syria	433	12.4	556	15.9	-	-	944	27.0	1933	55.3	1565	44.7	3498	100.0
U.A.E.	3250	49.6	800	12.2	1850	28.2	135	2.1	6035	92.1	515	7.9	6550 (2)	100.0
Total	27238	30.8	20881	23.6	10490	11.9	6325	7.2	64934	73.5	23448	26.5	88382	100.0

(1) Includes an 'integrated' iron-steel project.
(2) To be added an 'integrated' oil project (U$2,500 million).

Source: As for table 2.6

Such investment is not limited to OAPEC countries, the non-oil states have also recently engaged in planning or implementing rather ambitious programmes with a considerable amount of investment allocated.

2.5 The Agrarian Sector

Although the relative importance of agriculture in the region has gradually decreased over the past 20 years, due to depopulation of the land, and developments within other industries, it remains a sector of vital importance in the region's economy. Agriculture is by far the largest single employer and the main source of livelihood in many Arab states and accounts for a significant share of regional exports.

As shown in Table 2.4, over the period 1960-70 agriculture in the region achieved an annual average growth rate at constant prices of 2.7 per cent, which increased to 4 per cent for the period 1970-80.

Relatively, agriculture makes the largest contribution to GDP in the non-oil producing countries, for example in 1980 it amounted to 60 per cent of GDP in Somalia and 38 per cent in the Sudan. In the oil-producing states, agriculture is practically non-existent or of negligible importance, except in Algeria and Iraq, where it makes a modest contribution to the economy. However, agriculture has never been, and is never likely to be, of major economic importance in Bahrain, Kuwait and United Arab Emirates

due to the hot arid climate and the infertility of the soil.

In other Arab countries, the agricultural situation is as follows (Lloyd's Bank, 1978 and 1980):

1. The agricultural potential of a large part of Saudi Arabia is severely limited, and agriculture has been slow to develop. No significant improvement is expected in the near future.

2. Libya, before the discovery of oil, was primarily an agricultural economy; almost 80 percent of the population lives in rural areas and agriculture provides almost 60 per cent of GDP and the bulk of exports. However, by 1980 agriculture accounted for only 2 percent of GDP, and approximately 80 percent of Libyan food demands are now supplied from abroad.

3. In Egypt agriculture is still of major economic importance, employing about 40 percent of the labour force in 1977, accounting for 23 percent of GDP at current prices in 1980, and 60 percent of the total value of exports.

4. Agriculture is also significant in the economy of Tunisia, and an abundance of easily cultivable land is one of Tunisian's prime agricultural assets.

5. Agriculture in Morocco employs about 62 percent of the active labour force; it accounts for 80-90 percent of the country's domestic food requirements, almost 30 percent of total export value, and contributed 18 percent of GDP in 1980.

6. Jordan since the 1967 war, has been effectively deprived by the Israeli occupation of the most prosperous farming

land in her territory. In Lebanon the proportion of the total labour force employed in the agricultural sector has fallen from 40 percent to about 20 percent at present, as the population has tended to concentrate in urban areas.

Finally, in other Arab states agricultural development has varied from country to country. For example, in Syria and North Yemen this sector has grown by 8.2 percent and 3.7 percent at constant prices during the period 1970-1980, and made a contribbution to the GDP of 20 percent and 29 percent respectively at current prices in 1980.

2.6 Arab Construction Markets

In some Arab countries, construction spending has peaked because of the satiation of needs. Selection of industrial projects has become more sophisticated and greater attention is being paid to social programmes such as housing, education and hospitals. Estimates by Plantecon (Overseas) Research (Financial Times,1980) show that the construction market of the Arab states in the eastern part of the Arab World excluding Libya and Algeria was worth US $20.1 billion in 1977 almost doubling to US $38.4 billion in 1978. The major share of the market was taken by Saudi Arabia with 58.6 percent, followed by Iraq with 16.3 percent. But the highest average annual rate of growth has been achieved by Iraq at 60.2 percent and in Jordan by 57.1 percent during the period 1977-79 (see table. 2.8).

In 1979 the market as a whole grew by 5.8 percent to US

$40.6 billion with Saudi Arabia still growing at an above average overall pace, and with Iraq significantly expanding at the second fastest rate of growth (13.1 percent) and totalling US $7.1 billion (1). Even in Jordan, where expansion was on a smaller scale, there was an increase of 35 percent during 1979.

Plantecon also estimated that the size of the Arab construction markets is likely to change significantly over the next few years. For example, the Saudi market will reach a peak of US $24.1 billion in 1980, a marginal increase over the 1979 figure. But thereafter it will decline until it reaches US $15.1 billion in 1985; even then it would be more than twice the size of any other Arab market assessed for 1979. The notable exception amongst the Eastern Arab oil producers is Iraq. Most observers are agreed that this market will continue to expand, especially after the war with Iran, in order to rebuild the economy after the heavy damage it has sustained during the Gulf War. In the Maghreb area (comprising Mauritania, Morocco, Algeria and Tunisia), Algeria is probably the only state with an expanding construction market.

Elsewhere in the region there are countries without the huge oil revenues held by some of their neighbours but which have nevertheless started extensive development programmes. These countries include, Sudan,North Yemen, South Yemen and Egypt.

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(1) In 1981, Iraq was the largest construction market in the Arab World and worth at least U.$ 23 billion, which put it ahead of Saudi Arabia, (Financial Times, December 22nd,1982).

Table 2.8

Some Arab Construction Markets (1977-1979)

(U.$ million)

Country	1977	1978	Change 1978 over 1977 %	1979	Change 1979 over 1978	Average Annual Growth(per -centage)
Bahrain	320	370	15.6	350	-5.4	4.6
Egypt	1713	2350	37.2	2460	4.7	19.8
Iraq	2750	6240	264.1	7060	13.1	60.2
Jordan	320	585	82.8	790	35.0	57.1
Kuwait	1020	1480	45.1	1340	-9.5	14.6
Oman	483	565	17.0	610	8.0	12.4
Qatar	461	480	4.1	440	-8.3	-4.8
S. Arabia	10390	22500	116.6	24000	6.7	52.0
Sudan	n.a	485	-	526	8.5	-
Syria	630	1590	152.4	1450	-8.8	51.7
U.A.E.	1960	1740	-11.3	1570	-9.8	-10.5
Total	20047	38385	91.5	40596	5.8	38.6

Source: (Financial Times, 1980).

Note: (1) Year 1977: (Financial Times, 1979).

(2) Figures for 1978 and 1979 at 1978 prices.

2.7 Transport and Communication

Generally, the development of communications networks - road, sea, air and telecommunications - has gone ahead at extraordinary speed. Most Arab States have realized that adequate communications are a pre-requisite to economic progress.

2.7.1 Growth in Air Travel and Airports Expansion

Recent studies by the International Air Transport Association indicate that in the period from 1979 up to 1984 passenger air travel between Europe and the Middle East was expected to grow at an average annual rate of about 10.6 percent. The major airlines of the Arab World (Air Algerie, Alia of Jordan, Egyptair, Gulf Air, Iraqi Airways, Kuwait Airways, Libyan Arab, Middle East Airlines of Lebanon, Saudia of Saudi Arabia, Syrian Arab and Tunisia Air) collectively carried in 1979 more than 17 million passengers, or just over 10 percent more than in 1978, and this figure is expected to increase considerably in the future (Financial Times, 1980).

The biggest single expansion by any airline was recorded by Saudi Arabia whose traffic rose by about 26 percent to reach just over 8 million. This is expected to rise further during the period 1983-1987, reflecting the very substantial contribution that civil aviation is making to the country's internal as well as the international development. To increase carrying capacity and replace some ageing aircraft, the Arab states should order some 300 jet airliners worth US $5 billion over the next decade.

It is estimated that during 1979 the major airports in the Arab countries handled between them more than 20 million passengers, a rise in the service of about 30 percent, reflecting the booming air traffic to, from, within and through the region. For the near future it seems likely that the Arab states in general, and those of the Middle East in particular, will continue to enjoy a period of considerable expansion. Throughout the developing world as a

whole some £40 billion (US $93.5 billion), is likely to be spent on airports and their ancillary services over the next decade, and that of this sum perhaps one-third is likely to be spent in the Arab States. (Financial Times, 1980). By far the biggest programme of airport developments in the Arab World is that being undertaken in Saudi Arabia, where the Saudi Arabian International Airports project has been set up specifically to administer the construction of the three major new international airports in Riyadh, Jeddah, and Dhahran. A new international airport at Baghdad, with an annual handling capacity of 10 million passengers was completed in 1982.

2.7.2 Arab Fleet Growth

The size of the Arab shipping fleet has been growing considerably faster than the overall world shipping fleet. In 1967 it amounted to just 1 million grt., as against a world fleet of 182 million grt. With the first rise in oil prices at the end of 1973, the Arab fleet totalled 3.3 million grt. (22.0 percent average growth rate during the period 1967-73), compared with the total world fleet of 290 million grt. with an annual average growth rate of 8.0 percent for the same period. (Financial Times, 1980).

Table 2.9 shows the further rapid growth between 1978 and 1982 during which time the number of ships over 1000 grt increased from 486 to 705. Saudi Arabia is the world's fastest growing major shipping nation.

Table 2.9

Arab Fleet Growth (1978-82)[1]

(1000 grts)

Country	1978		1979		1980		1981		1982	
	No.	Grt	No.	Grt	No.	Grt.	No.	Grt	No.	Grt
Algeria	63	1044	77	1180	78	1217	76	1284	74	1353
Bahrain	-	-	-	-	1	1	4	7	2	5
Dujibouti	-	-	-	-	-	-	-	-	-	-
Egypt	78	402	88	437	91	465	94	449	99	475
Iraq	28	1116	31	1216	30	1208	51	1405	51	1389
Jordan	-	-	-	-	-	-	-	-	2	11
Kuwait	73	1910	96	2228	105	2611	79	2229	68	2033
Lebanon	61	180	66	204	74	211	80	215	90	257
Libya	26	466	28	529	27	622	25	619	28	875
Mauritania	-	-	-	-	-	-	-	-	1	2
Morocco	41	299	48	322	46	331	48	334	48	334
Oman	2	3	2	3	2	3	-	-	-	-
Qatar	2	80	2	80	3	82	6	92	12	190
S. Arabia	52	911	63	1129	74	1321	110	1956	166	3716
Somalia	4	14	4	14	4	14	3	11	3	11
Sudan	7	38	7	38	12	83	10	91	10	91
Syria	5	10	13	30	11	28	9	23	7	22
Tunisia	18	92	21	104	22	121	19	124	20	129
U.A.E.	26	142	16	118	10	81	17	105	22	149
Yemen (N)	-	-	-	-	-	-	-	-	-	-
Yemen (S)	-	-	1	2	2	3	2	3	2	3
Total	486	6707	563	7634	592	8402	633	8947	705	11045
				13.8%		10.1%		6.5%		23.4%

(1) Ships over 1000 grt.

Source: Barber (1982, p7).

Given the recession in the shipping industry, future growth is likely to be slower than in the past. Nevertheless the number of orders for new ships placed in 1982 (see table 2.10) indicates that Arab fleets will continue to grow and increase their share of total world shipping from the current 2%.

Table 2.10

Ships Ordered by Some Arab States
(as at 1.1.1982).

Country	No.	Grt(000's)	% share
Kuwait (1)	15	806	60.6
S. Arabia	4	140	10.5
U.A.E.	7	124	9.3
Morocco	7	112	8.4
Egypt	5	92	6.9
Tunisia (2)	3	34	2.6
Iraq	4	15	1.1
Libya	1	8	0.6
Total	46	1331	100.0

(1) Includes 9 vessels on order for UASC which when delivered will fly the flags of the various member countries.

(2) Includes an unconfirmed order by Cotunav

Source: Barber (1982, p5).

2.7.3 Telephone and Pipeline Systems

Some Arab countries have allocated unexpectedly large amounts in their development planning to modernize their telephone system. The Iraqi government, for instance, has installed the most modern computerised telephone system at a cost of US $10 billion. At the end of 1981 Saudi Arabia completed the world's first entirely computer controlled metropolitan telephone system, and plans to spend US $5 billion over the current third five-year plan (1980-85). Bahrain possesses the most efficient telecommunication system in the Middle

East; and Egypt, which also has plans for a total overhaul of the telephone system over the next 20 years, could spend up to US $5 billion.

There have been pipelines from some of the oil-fields to the Mediterranean coast and the Arabian Gulf for many years, but given the rapid rise in oil exports some of the Arab states have invested heavily in new pipelines, including:

- Iraq's Haditha-Fao 'strategic' pipeline to the Gulf, and the pipeline from Northern Iraq to Dortyol on Turkey's Mediterranean coast(1)

- Algeria's 2500 km trans-Mediterranean pipeline through Tunisia and Sicily to Italy
- Egypt's SUMED pipeline (half owned by a consortium of Saudi Arabia, Kuwait, UAE and Qatar) from Ain Al-Sukhna to the west of Alexandria
- Saudi Arabia's pipelines from the Gulf coast to the eastern Mediterranean at Sidon, Lebanon (1718 km) and a 1250 km pipeline under construction between the Ghawar oil field to the Red Sea port of Yanbu.

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(1) The stoppage of the Iraqi oil exports through Syria and the Port of Basra, due to the present war between Iraq and Iran, has encouraged the government to build two new pipelines, the first through Saudi Arabia and the second through Jordan.

2.8 Trade Sector Growth

2.8.1 Volume of Trade

The rise in the volume and value of the region's external trade has been considerable since the second World War. The major factors relating to the growth in the volume of imports are:

(i) the drive for development which necessitated the importation of raw materials, intermediate and capital goods; and

(ii) the increasing need for consumer goods, mainly foodstuffs, where domestic production is unable to keep up with the demand. The major factors in regard to the increasing volume of exports are; the discovery of the natural resources of crude oil in many Arab states, iron ore in the Maghrib area, and phosphate rock in other states.

Between 1970 and 1980 Arab exports as a proportion of world trade increased from 4.3 percent to 12.4 percent, and imports from 2.6 percent to 5.9 percent. Table 2.11 shows that during the period 1970-80 the average (unweighted mean) annual growth rate at current prices for imports was higher than the growth rate of exports, due mainly to an increased capacity to import through rising oil exports earnings. Overall, the major factor was the rise in price of oil which cut the growth in the volume of oil exported. However, during the same period, the average growth rate of imports at constant prices was more than six times the average annual growth rate of exports.

Saudi Arabia, of the oil-producing states, and Jordan of the non-oil producing states, have achieved the highest growth rates of imports of 35.2 percent and 13.5 percent respectively (see table 2.11).

Table 2.11

Annual Average Growth Rate of Trade in the Arab Countries, and Exports as a Percentage of GDP in Local Currencies (percent).

Country	Exports at current prices		Imports at current prices		At constant prices		Exports as a percentage of GDP at current prices	
					Exports	Imports		
	1970-80	1974-80	1970-80	1974-80	1970-80	1970-80	1970	1979
Algeria	26.5	17.8	20.9	16.3	2.2	12.7	21.7	30.2
Bahrain	29.3	18.0	27.3	19.8	n.a	n.a	n.a	n.a
Dujibouti	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a
Egypt	20.5	23.8	25.8 N1	24.4 N1	-0.7	8.8	11.1	10.3
Iraq	38.4	25.9	27.2	15.5	2.2	20.5	23.6	n.a
Jordan	30.3	22.9	26.9	28.8	18.4	13.5	7.0	17.0
Kuwait	24.4	10.0	23.0	25.3	-8.5	16.3	62.9	74.8
Lebanon	n.a	n.a	n.a N2	n.a N2	0.7	2.4	n.a	n.a
Libya	20.8	21.1	25.9	14.0	-6.5	16.8	71.1	57.5
Mauritania	6.1	1.4	15.5	15.8	-1.1	5.6	52.5	24.2
Morocco	14.6	4.4	17.1	12.5	2.1	8.5	14.6	12.2
Oman	30.0	19.4	54.7	28.1	n.a	n.a	76.8	63.8
Qatar	33.9	17.3	34.4	30.4	n.a	n.a	n.a	n.a
S. Arabia	41.5	20.5	41.1	46.5	5.4	35.2	60.8	79.1
Somalia	14.8	14.7	18.3	13.4	5.5	7.2	n.a	n.a
Sudan	10.1	14.2	22.9	21.3	-5.7	3.5	14.8	8.1 N1
Syria	26.7	19.0	27.9	23.5	6.8	13.0	12.1	16.6
Tunisia	25.0	14.4	24.5	19.6	4.8	10.6	12.6	24.7
U.A.E.	41.3 N2	20.3 N2	38.2 N2	29.9 N2	6.1	27.7	n.a	65.0
Yemen (N)	16.3	0.3	49.9	51.0	n.a	n.a	0.9	3.5
Yemen (S)	16.9	22.7	20.3	24.1	n.a	n.a	82.3	n.a
Average	24.6	16.2	28.5	24.2	2.1	13.5	35.0	34.8

Source: (1) Compiled from I.M.F., International Financial Statistics, Year-book 1982. Country pages.

(2) The World Bank (1982, pp.124-5).

N1: Figures are for 1970-78 and 1974-78, not 1970-80 and 1974-80.

N2: Figures are for 1970-79 and 1974-79, not 1970-80 and 1974-80.

Table 2.11 also shows the importance of exports to the gross domestic product in 1970 and 1979. In general, the percentage contribution of exports to GDP in oil-producing states was higher than in non-oil producing states, due to the dominance of oil exports.

An interesting comparison can be made between the periods 1960-70 and 1970-80, concerning the growth of Arab trade with other regions in the world. Arab exports achieved the highest growth rate of 13.2 percent per annum at constant prices for the first period and declined to 2.1 percent in the second period. As regards imports, during the 1960's the Arab countries had the lowest average annual growth rate but that position was reversed during the 1970s. Then the rate of increase of 13.5 percent per annum was over four times that of the low income countries, over three fold that of both the middle income and the industrialized countries, and over two fold that of non-market industrial economies (see table 2.12).

Table 2.12

Comparison of Growth of Foreign Trade at Constant Prices of Arab Countries With Rest of the World (1960-70)(1970-78).

Country Group	Exports		Imports	
	1960-70	1970-80	1960-70	1970-80
Arab countries (unweighted mean)	13.2	2.1	4.5	13.5
Low-income countries (1)	5.0	-0.4	5.4	3.1
Middle-income countries (2)	5.4	3.9	6.4	4.2
Industrialized countries	8.5	5.8	9.5	4.4
Non-market industrial economies	9.0	7.1	7.9	6.6

Source: The World Bank (1982, pp.124-5)

(1) Include Somalia and Sudan

(2) Include Egypt, North Yemen, South Yemen, Morocco, Syria, Tunisia, Jordan, Lebanon, Iraq, Algeria and Mauritania.

2.8.2 The Balance of Trade

The overall picture of the current trading position of the Arab countries is shown in table 2.13. The main factors revealed by the table are:

(a) the fundamental difference between the trading positions of the oil states (which apart from Algeria, all earned trade surpluses) and the non-oil states which all incurred trade deficits, (except for Mauritania) in the period 1970-75; and

(b) although throughout the period the aggregate Arab trade balance was positive, it fluctuated substantially, largely in response to increases in oil prices.

As shown in table 2.14, oil accounts for over 90 percent of the total exports earnings of the oil producing countries. The size of the increases in both oil prices and the trade surpluses of the oil-States since 1973 has had profound effects on the structure and performance of not only those countries, but on the rest of the world as well. Although the fall in oil prices and cuts in production implemented since 1982 have reduced earnings, in general terms the Arab oil producers are expected to remain in surplus for the foreseeable future.

2.8.3 The Trade Structure

There are two major facets to Arab exports. Firstly, they are heavily dependent on the primary production of mainly agrarian products and crude oil, and secondly most Arab countries concentrate

Table 2.13

Balance of Trade in the Arab World at Current Prices for 1970-1980 (U.$ billion).

Country Group	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	Average g.rate
Oil-States	6.181	7.434	7.872	11.854	52.882	44.313	52.623	48.380	34.980	81.884	131.277	35.7
Non-oil States	-1.200	-1.500	-1.514	-1.723	-3.466	-7.376	-7.755	-11.184	-11.347	-12.738	-14.481	28.3
Balance	4.981	5.934	6.358	10.131	49.416	36.937	44.868	37.196	23.633	69.146	116.796	37.1

Source: Compiled from I.M.F. International Financial Statistics, Yearbook (1979, pp.63-9) and (1980, pp.67-73).

Table 2.14

Values of Oil Exports as a Percentage of Total Country's Exports During 1970-80.

Country	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
Algeria	67.5	71.7	78.8	80.6	91.0	91.3	90.8	92.9	93.4	90.9	91.6
Iraq	92.5	94.3	92.2	94.5	98.6	98.5	98.3	98.5	98.1	99.0	99.2
Kuwait	94·2	94.4	92.7	91.2	89.9	97.5	91.1	89.6	90.5	91.9	91.8
Libya	99.7	99.8	99.8	99.9	99.95	99.9	99.9	99.9	99.9	99.9	99.96
Oman	99.5	99.4	99.5	99.5	99.9	99.8	99.7	99.7	99.4	99.4	99.6
Qatar	96.2	96.3	96.2	97.3	98.2	97.2	96.7	98.7	98.9	96.1	95.0
S. Arabia	93.5	99.9	99.7	99.7	99.7	99.6	99.7	99.8	99.7	99.8	99.9
U.A.E.	95.0	95.9	95.7	96.6	98.7	97.8	96.5	96.1	94.9	94.3	93.8

Source: Compiled from I.M.F.,International Financial Statistics Yearbook 1980, Country pages.

highly on just one or a few commodities. Primary agricultural products occupy a significant position in the exports of many states, notably Egypt, Sudan, Somalia, Morrocco and North Yemen, and in Egypt and Sudan, for example, cotton is expected to maintain its dominance as the leading crop.

The imports of individual states are more diversified than exports, and include consumer goods, capital goods, food stuffs and raw materials. In many Arab countries, the rise in imports is due to the growing number of industrial and construction projects, increased consumption of consumer goods and increasing opportunities for re-exports.

2.9 The Oil Industry

Having reviewed the development of various economic sectors, this section makes some attempt to show the importance of the oil industry in the economies of Arab oil producers.

2.9.1 Oil Production and Revenues

There have been some marked changes in the pattern of world petroleum production over the last two decades. The world leaders in total production are shown below:

	1960	1969	1974	1981	1982
First place	U.S.A. 35%	U.S.A. 24%	U.S.A. 17.3%	U.S.S.R. 21.1%	U.S.S.R. 22.2%
Second place	Venezuela 13.63%	U.S.S.R. 15.3%	U.S.S.R. 15.9%	S.Arabia 17.0%	U.S.A. 18.4%
Third place	U.S.S.R. 13.56%	Venezuela 8.7%	S.Arabia 14.3%	U.S.A. 16.7%	S.Arabia 11.9%

Source: (1) BP (1979 and 1981, p.18).

(2) IPIS (1970, p.2), (1982, p.3) and (1983, p.2).

The most critical factor in the production of petroleum since the second World War has been the extensive development of Arab oil fields.

As shown in table 2.15, the general trend toward increased production has been accompanied by periodic declines in the output of individual states, particularly Kuwait, Libya, Oman, and Qatar.

Table 2.15

Arab Oil Production and Annual Average Growth Rate for 1971-81 (Thousand Barrels Daily)

Country	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	Yearly change 81/71	Yearly change 81/76
												%	%
Algeria	780	1060	1095	1010	1020	1075	1150	1230	1225	1105	1010	2.4	-1.5
Iraq	1700	1465	2020	1970	2260	2415	2350	2560	3475	2645	900	-6.2	-18.0
Kuwait	2975	3055	2810	2330	1885	1965	1835	1945	2270	1425	965	-10.7	-13.3
Libya	2765	2240	2180	1520	1480	1930	2065	1985	2090	1790	1120	-8.6	-10.4
Oman	285	280	295	290	340	365	340	315	295	285	315	1.0	-2.9
Qatar	430	485	570	520	435	495	435	485	510	470	405	-0.5	-4.0
Neutral Zone (1)	545	565	535	540	500	465	390	470	570	535	370	-3.8	-4.6
S. Arabia	4545	5785	7440	8350	6970	8525	9235	8315	9555	9990	9990	8.1	3.1
U.A.E.	1060	1205	1525	1680	1695	1945	2015	1820	1815	1705	1510	3.6	-5.0
Total	15085	16140	18470	18210	16585	19180	19815	19125	21805	19950	16585	1.0	-2.9

(1) Kuwait and Saudi Arabia each possess a half interest in the Neutral Zone.

Source: Compiled from B.P. (1981, p.19).

On the other hand, in Saudi Arabia, there is an exceptional position derived from its possession of at least one-quarter, perhaps as much as one-third of the non-Communist world's reserves. Her production has increased sharply from 4.545 million b/d in 1971 to reach a record of 9.990 million b/d in 1981, thus achieving the highest growth rate in the area at 8.1 percent per annum, followed by UAE.

The world oil glut had a marked effect on the Arab oil production in 1982. For example, in Saudi Arabia output fell to its lowest since 1972, leading to a large drop in revenue in 1982. A continued low level of oil exports in 1983 combined with lower oil prices means that it is possible that some oil producers, such as Saudi Arabia and Kuwait for example, may announce a government budget deficit, at least in short term.

As regards oil revenues, table 2.17 illustrates that the income from oil exports increased markedly over the period 1970-80 and especially after the oil embargo in 1973, with accompanying huge rises in oil prices. The sharp increase in oil revenues was due principally to the increases in oil prices. Table 2.17 also shows that the average annual growth rate for oil revenues in all Arab oil exporting states reached 32.8 percent (at current prices) for the period 1970-80 and 23.0 percent for the period 1975-80. However, inflation eroded the real values of those export earnings and as a result heavier financial burdens are being imposed on Arab oil producers in recent years.

Table 2.16

Arab Oil Production as a Percentage of Total World Production

1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
29.7	30.2	31.6	31.1	29.8	31.9	31.7	30.3	33.2	31.8	28.1

Source: Table 2.15 and B.P. (1981, p.19).

Table 2.17

Oil Revenues in Arab Oil Producing Countries for the Period 1970-80 at Current Prices (million - local currencies)

Country	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	Average Growth rate 70-80	Average Growth rate 75-80	Oil Revenue to GDP in 1979
Algeria	3360	3016	4614	6030	17838	16963	20157	23554	23380	33181	47998	30.5	23.1	27.5
Iraq	279.9	379.2	340.3	555.3	1921.0	2414.6	2691.4	2806.9	3204.2	6287.0	7718.3	39.3	26.2	n.a.
Kuwait	569.9	763.0	779.5	894.7	2722.5	2443.9	2617.2	2515.3	2591.6	4634.6	4929.0	24.1	15.1	68.7
Libya	1010.2	1025.0	813.0	1035.8	2109.7	1786.9	2456.7	2885.8	2809.4	4506.7	6680.6	20.8	30.2	57.4
Oman	81.7	87.6	88.2	114.8	392.4	497.1	539.5	541.8	519.0	743.3	1133.2	30.1	17.9	63.4
Qatar	1076	1421	1674	2400	7813	6906	8467	7817	8889	13494	19701	33.7	23.3	n.a.
S.Arabia	9.89	14.92	18.84	28.93	110.54	104.54	136.91	154.98	128.56	197.12	339.37	42.4	26.6	79.0
U.A.E	2307	3803	4541	6953	24966	27006	33123	36138	33528	49078	72125	41.1	21.7	61.3
												32.8	23.0	59.6

Source: I.M.F. International Financial Statistics, Yearbook 1982, Country Pages.

Note: Figures for Saudi Arabia are in billions.

2.9.2 Future Prospects

The future contribution of oil to the economies of Arab countries will depend upon many factors, which include;

(a) the size of oil reserves and the rate of extraction; and

(b) their refinery capacities (which will determine the extent to which they can export higher priced refined petroleum products, instead of crude oil).

Proven oil reserves at the end of 1982, measured in terms of both aggregate reserves and productionyears at 1982 extraction rates, are shown in table 2.18. It was estimated that the total oil reserves of OAPEC states accounted for 52.4 percent of total world oil reserves at the end of 1979 (the annual report of OAPEC, 1979, p.5): at the end of 1982 that figure could have risen to 60 percent. The size of reserves is such that the Arab region as a whole will continue to earn considerable oil revenues until the middle of the next century which will provide the finance for future industrial and commercial development.

It has been estimated that there will be 47 refineries in OAPEC countries by 1985, with a combined capacity of 6,378 thousand b/d as shown in table 2.19, or 49 percent of the total OAPEC output (except Syria) at the 1982 rate of production.

Table 2.18

Proven Oil Reserves in OAPEC Countries at the End of 1982

Country	Total output (Thousand b/d)	Proven Oil Reserves	
		Total reserves (million barrels).	Number of years production at 1982 extraction rates
Algeria	835	9440	31
Bahrain	194	197	3
Egypt	710	3325	13
Iraq	980	41000	115
Kuwait	695	67150	264
Libya	1165	21500	51
Qatar	340	3425	28
Saudi Arabia	6690_N	165320	68
Syria	182^N	1521	23
Tunisia	n.a	1860	n.a
U.A.E.	1230	32354	72
	13006	347092	73

Source: (1) Oil reserves; Oil and Gas Journal, 27.12.1982. as cited in OAPEC Bulletin (1983, p.15).

(2) Oil Production; (a) BP (1982, pp.18]19).
(b) OAPEC (1983, p.16) for Bahrain.
(c) OAPEC (1981, p.16) for Syria.
N = Figure is for 1981.

Table 2.19

OAPEC Refinery Capacities, 1982

(1000 b/d)

Country	Installed	Underway	Planned	Total
Algeria	521	-	-	521
Bahrain	250	-	-	250
Egypt	332	20	250	602
Iraq	335	200	200	735
Kuwait	560	150	-	710
Libya	138	220	-	358
Qatar	13	50	-	63
S. Arabia	865	995	550	2410
Syria	224	-	-	224
Tunisia	30	100	-	130
U.A.E.	135	60	180	375
Total	3403	1795	1180	6378

Source: OAPEC (1983, pp.16-17).

2.9.3 Gas Production and Reserves

The build-up of natural gas production and known reserves during the 1970s is shown in tables 2.20 and 2.21. Algeria is likely within the near future to be the world's largest gas exporter, having signed contracts with many European and other countries. In order to fulfil its commitments, it is investing heavily in liquifaction plants, tankers and pipelines.

Table 2.20

Production of Natural Gas in the OAPEC Countries 1970-79
(Thousand bdoe)

Country	1970	1973	1977	1978	1979
Algeria	47	57	134	155	142
Bahrain	8	10	52	55	31
Egypt	-	15	44	50	46
Iraq	13	73	67	55	25
Kuwait	0	24	88	89	98
Libya	-	20	231	172	75
Qatar	7	3	33	22	13
S. Arabia	-	-	57	48	96
Syria	-	-	33	26	16
U.A.E.	-	-	79	58	31
Total	75	202	818	730	573

Source: OAPEC Bulletin (1980, p.37).

Note: Information after 1979 as well as the values of production/exports is not available.

Table 2.21

Reserves of Natural Gas in the OAPEC Countries, 70-79
(Million boe)

Country	1970	1973	1977	1978	1979
Algeria	24310	18266	21551	18103	22759
Bahrain	862	690	517	1207	1552
Egypt	862	724	552	517	517
Iraq	3190	3793	4828	4793	4741
Kuwait	7241	6293	5862	5828	5777
Libya	5172	4655	4431	4172	4138
Qatar	1379	1379	6897	6897	10345
S. Arabia	9224	9466	15096	16621	16505
Syria	129	121	535	259	259
U.A.E.	1767	2586	3707	3724	3534
Total	54136	47973	63996	62121	70127

Source: OAPEC Bulletin (1980, p.38).

Note: Information after the year of 1979 not available.

2.10 Planning for Development

All Arab governments have drawn up plans to direct investment into the development of their economies. Although the precise content and form of those plans vary according to the political systems and ideologies of the countries, their resources and stage of development, in many cases the industrial sector ranks as a development priority. Especially in the oil producing countries almost unlimited funds have been made available to finance new investment. For example, Saudi Arabia's expenditure under the second development plan (1975-80) reached SR700 billion (US $210 billion) against its planned expenditure of SR 498 billion, and in its third plan (1980-85) expenditure is expected to exceed SR1000 billion (US $300 billion). As can be seen from table 2.22, the government expenditure of the oil producing countries has grown rapidly.

Table 2.22

Annual Average Growth Rate of Oil Income and Government Expenditure (in percent).

Country	Oil revenue	Government expenditure	Time period
Algeria	41.5	22.3	1972-79
Iraq	65.0	35.7	1972-79
Kuwait	31.2	38.2	1972-79
Libya	29.8	20.0	1972-78
Qatar	116.0	50.0	1972-79
S. Arabia	46.5	42.7	1972-79
U.A.E.	43.7	39.0	1972-79
Average	53.4	35.4	1972-79

Source: OPEC Bulletin (1981) and OPEC Statistical Bulletin (1979), as cited in Griffin and Teece (1982, p.84).

There are three crucial factors which may affect the Arab world's economic development , these are:

1. The continuation of the Middle East conflict. Despite the agreements signed between Egypt and Israel, instability and an increase in the arms race in the Middle East have currently reached their highest level.
2. The conflict between Iraq and Iran, that broke out in 1980, is another serious problem, in that it has brought to a head the political differences between Arab countries. Enormous amounts have been allocated in some Gulf States to improve their defence capabilities.(1)
3. The fall in the world demand for oil has reduced the money available for investment, and may force countries to modify their development plans. Consequently some countries, such as Saudi Arabia, Kuwait, and Libya, are concentrating on the completion of unfinished projects, particularly in the industrial sector. It seems likely that these countries are prepared to draw on reserves to finance their budgets.

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1. Because of the powerful influence of politics, joint projects such as manufacturing among Arab countries, frequently come to nothing.

2.11 Conclusions

The Arab region comprises 21 countries varying widely in geographical size, population, stages of economic development, and levels of income. The sharpest distinction is between the oil-producing and non-oil producing states. The large increases in oil prices which have occurred since 1973 have principally benefited those oil producers who have used some of the greatly increased export earnings to embark on ambitious economic development programmes aimed at diversifying their economies, besides improving living standards for their peoples. However, some of the benefits of the oil boom have spilled over into the rest of the region, where some development projects have been financed by borrowing from the oil producers.

Consequently, in contrast to most of the rest of the world, the last decade has been one of rapid economic growth in the Arab region. For the insurance industry that has meant a large increase in the demand for all classes of insurance, which can be expected to continue to grow. However,the manner in which the economic development has occurred, particularly in the oil-producing states, has meant that a large proportion of the demand for non-life insurance has been concentrated on large individual risks (e.g. oil installations and refineries, steel plants, oil pipelines, super tankers and major construction projects). What that fact implies for the region's insurance industries will be considered in later chapters.

CHAPTER THREE

DEVELOPMENT OF THE INSURANCE INDUSTRY IN THE ARAB WORLD

3.1 Introduction

In ancient times, the Middle East enjoyed, through the Code of Hammurabi of the Babylonians, one of the first systems for the spreading of risks, and for generations most Arab communities have had social arrangements to assist those members who, through misfortune, suffered injury or loss. However, it was not until the advent of the Europeans in the 19th Century that the modern system of insurance was introduced to the Arab world, and even then it was confined to the protection of European owned enterprises. The emergence of national insurance markets has been, in large measure, the product of the ending of colonial status, and the large increase in the demand for insurance following the rapid economic development of the region over the last two decades (as discussed in Chapter 2).

The purpose of this chapter is:

(a) to describe the development of Arab insurance markets:

(b) to analyse their main characteristics; and

(c) to consider their future development.

3.2 Historical Evolution

Insurance business commenced in the Arab world in the late 19th century with the establishment of European insurance company agencies in the capitals of the Arab countries where European owned enterprises were in operation. Table 3.1 lists the first insurance

Table 3.1

First Foreign and National Insurance Company Operating in the Arab World

Company	First Insurance Company Operating Name	Date	First National Company Name	Date
Algeria	N.a		CAAR	1963
Bahrain	N.a		Bahrain Insurance Co.	1971
Egypt	Various British and French companies	First half of 19th century	National Insurance Co.	1900
Iraq	Provincial Ins. and Guardian (British)	1920	Rafidain Insurance Co.	1946
Jordan	Royal Insurance Co. (British)	N.a	Jordan Insurance Co.	1951
Kuwait	Royal Insurance Co.(British)	1950	Kuwait Insurance Co.	1960
Lebanon	Guardian Insurance Co.(British)	1919	La Union National	1947
Libya	N.a		Libya Insurance Co.	1964
Mauritania	N.a		SOMAR	1974
Morocco	La Espanola (Spanish)	1879	Le Marco	1916
Qatar	N.a		Qatar Insurance Co.	1964
S. Arabia	American Inter.Underwriters(USA)	1953	None	
Somalia	Liverpool, London & Global (British)	1954	SICOS	1972
Sudan	N.a (British)	1898	Sudanese Motor Ins. Co.	1952
Syria	N.a (French)	1919	Societe d'Assur.Syrienne.	1953
Tunisia	Caisses Agricoles Regionales (French)	N.a	Agriculture Mutual,CTAMA.	1912
U.A.E.	N.a		Dubai Insurance Co.	1970
Yemen (S)	North British & Mercantile (British)	1881	National Ins. & Reinsurance Co.	1970

Source: (1) Extracted from Swiss Re (1964), country pages.
(2) GAIF (1977), country pages.

companies to operate in the region.

1900 saw the establishment of the first Arab national insurance company (the National Insurance Company of Egypt), but between then and 1945 few other similar companies were founded. However, after Arab countries gained their independence, and especially in the 1960's and 1970's, many more domestic companies were established (see table 3.1).

Even following the formation of national companies, foreign companies continued to dominate the Arab insurance market for some years. That position has been reversed in the last two decades, through the domestication and sometimes nationalisation of many of the markets. The replacement of foreign insurance companies by locally-owned companies between 1960/61 and 1982 is shown in table 3.2 Although the number of Arab companies has almost trebled during that time, they still account for only 1.6 percent of the total number of companies operating worldwide (see table 3.3), and under 10 percent of the companies incorporated in developing countries (see table 3.4).

The ratio of foreign companies to domestic companies operating in the Arab region as a whole is still far higher than in other developing regions of the world (see table 3.4). However the position varies between countries. As shown in table 3.2, no foreign companies now operate in Algeria, Iraq, Libya, Mauritania, Morocco, Somalia, Southern Yemen, Sudan, Syria and Tunisia, having either been expelled by law, or having chosen to withdraw rather than comply with supervisory authorities' requirements. Typically in the latter case the insurer had only a small amount of business in the country,

Table 3.2

Number of National and Foreign Insurance Companies in the Arab World (1)

Country	Number of companies 1960-61			Number of companies -1982		
	National companies	Foreign Cos &/or agents	Total	National companies	Foreign Cos &/or agents	Total
Algeria	n.a	n.a	n.a	4	0	4
Bahrain	n.a	n.a	n.a	4	11	15
Dujibouti	n.a	n.a	n.a	n.a	n.a	n.a
Egypt	17	41	58	7	2	9
Iraq	4	17	21	3	0	3
Jordan	1	17	18	21	11	32
Kuwait	1	31	32	5	15	20
Lebanon	3	69	72	42	49	91
Libya	n.a	n.a	n.a	1	0	1
Mauritania	0	24	24	1	0	1
Morocco	22	225	247	19	0	19
Oman	0	0	0	1	12	13
Qatar	0	n.a	n.a	1	4	5
S. Arabia	0	10	10	0	150	150
Somalia	0	10	10	1	0	1
Sudan	2	63	65	13	0	13
Syria	1	71	72	2	0	2
Tunisia	4	50	54	12	0	12
U.A.E.	0	n.a	n.a	19	52	71*
Yemen (S)	0	40	40	1	0	1
Yemen (N)	0	n.a	n.a	3	0	3
Total	55	668	723	160	306	466

*Figures for 1979.

Source: Swiss Re (1964) for number of companies as at 1960/61.

(1) The number of insurance companies are constantly changing as new companies are set up or conversely mergers and takeovers occur.

Table 3.3

Number of Arab Insurance Companies Compared with World Companies (1982)

Type of company	Total No. of World companies	(1) %	Total No. of co's operating in Arab region	%	Co's operating in Arab region / World Co's
Domestic Companies	10,146	79.7	160	34.3	1.6
Foreign Branch Offices	2,580	20.3	306	65.7	11.9
Total	12,726	100.0	466	100.0	3.7

Sources: (a) Sigma, No. 11/12, 1982, p.3.

(b) Table 3.2

Note: (1) The 10,146 figure represents the domestic private insurance companies operating world-wide, and their foreign branch offices which total 2,580.

Table 3.4

Insurance Companies in the Arab World Compared With the Rest of the Third World

Country Group	Domestic	%	Foreign	%	Total	%	Foreign / Total
Latin America	771	47.8	290	27.6	1061	39.9	27.3
Asia (excl. Arab States)	430	26.7	339	32.3	769	28.9	44.1
Africa (excl Arab States)	251	15.6	114	10.9	365	13.7	31.2
Arab World	160	9.9	306	29.2	466	17.5	65.7
Total	1612	100.0	1049	100.0	2661	100.0	39.4

Sources: As for table 3.3.

usually written through an independent general agent, so that, for example, a requirement to incorporate locally was viewed as uneconomic.

Conversely, there has been a large inflow of foreign insurers to the United Arab Emirates and Saudi Arabia, attracted by their large development potential, and the lack of insurance regulation. Whereas in 1979 the 71 insurers operating in the U.A.E. shared a total premium income of only US $133 million, of which over 40 per cent was written by the largest company, in Saudi Arabia there was a far larger volume of business available. Nevertheless, in both countries intense competition has forced down premium rates to such an uneconomic level that some companies are now withdrawing.

Prior to 1970, the premium income of all Arab insurance markets was very small indeed (see table 3.5). Although insurance business has grown rapidly since then, the Arab insurance markets are still in their infancy. Table 3.6 shows the premium income in eight Arab countries split between domestic and foreign companies in 1960. The split of the total premiums written between domestic and foreign companies for the years 1974-79 will appear in section 3.8.

3.3 Structure of Arab Insurance Market

The market structures of the insurance industries operating in Arab countries, which range from monopolies to highly competitive markets, largely reflect their different political systems. They can be classified broadly into four types (see figure 3.1):

Figure 3.1

Structure of Arab Insurance Market

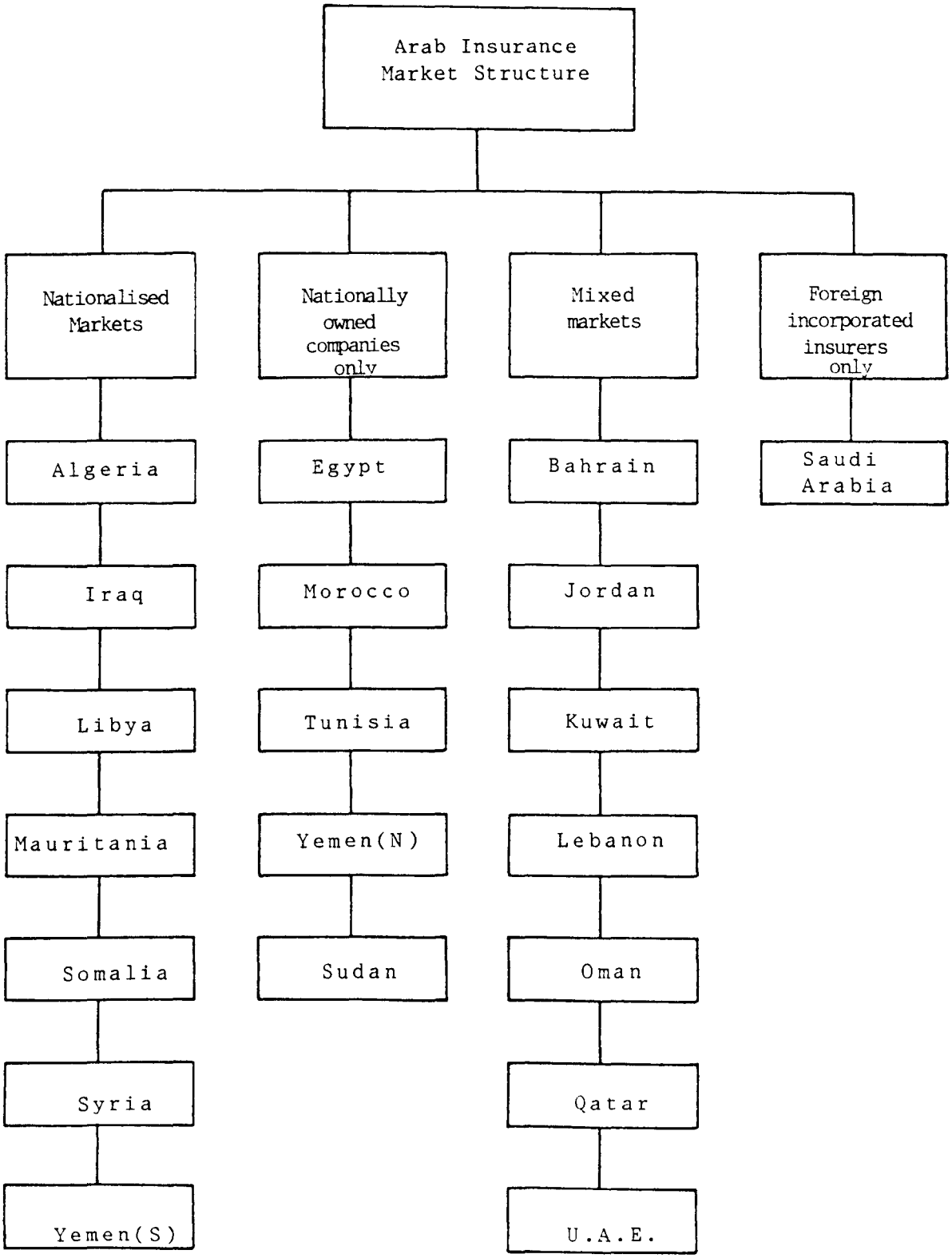


Table 3.5

Distribution of Premium Income into Life and Non-Life Business in 1960 (US$000's)

Country	Non-life	Life	Total
Egypt	19,803	16,953	36,756[N]
Iraq	5,431	657	6,088
Jordan	455	210	665
Kuwait	1,716	-	1,716
Lebanon	6,838	965	7,803
Mauritania	154	3	157
Morocco	35,328	3,292	38,620[N]
Saudi Arabia	1,061	38	1,099[N]
Syria	2,801	1,031	3,832[N]
Tunisia	7,565	1,603	9,168[N]
Total	81,152	24,752	105,904

Source: Compiled from Swiss Re (1964), Country pages.
N: Figures are for 1961.

Table 3.6

Share of Premium Income Distributed Among Domestic and Foreign Companies in 1960.

Country	Domestic Companies			Foreign Companies		
	Non-life US $000	Life US $000	Percentage of the total market	Non-life US $000	Life US $000	Percentage of the total market
Iraq	n.a	n.a	45.0	n.a	n.a	55.0
Jordan	98.9	1.1	27.0	58.9	41.1	73.0
Kuwait	0	0	0	100.0	0	100.0
Lebanon	76.1	23.9	25.4	87.4	12.6	74.6
Mauritania	0	0	0	98.4	1.6	100.0
Morocco	99.1	0.9	26.1	88.8	11.2	73.9
S. Arabia	0	0	0	n.a	n.a	100.0
Tunisia	92.1	7.9	35.1	75.2	24.8	64.9
			27.8			72.2

Source: Compiled from Swiss Re (1964), Country pages.

(1) The nationalised insurance markets of Algeria, Iraq, Libya, Mauritania, Somalia, Sudan, Syria, and Southern Yemen, which may be further divided into:

(a) Nationalised insurance markets with only one direct insurance company, such as Libya, Mauritania, Syria, and Southern Yemen, and

(b) nationalised markets with more than one direct company, such as Algeria, Iraq and Sudan.(1)

(2) Insurance markets where only locally owned private and/or government owned companies operate, such as Morocco, Tunisia and North Yemen.

(3) The mixed insurance markets where foreign and local insurers operate together. Within this group are Bahrain, Jordan, Kuwait, Lebanon, Oman, Qatar, and U.A.E.

(4) Saudi Arabia, where only foreign insurers operate because the incorporation of insurance companies locally is prohibited. Therefore Saudi owned insurance companies are incorporated in other countries in order to be able to operate in the market. The contradiction between the adoption of insurance throughout the Saudi economy and the Islamic objections to insurance is still acute.

Before 1974 Egypt, with three nationalised direct insurance companies, fell into category (1). Following the open door policy of that year, it permitted the formation of:

---

(1) Sudan has allowed foreign companies to participate to a limited extent in its market. UNCTAD (1982, p.6) has pointed out that the El-Nillien Insurance Company has been formed with the participation of Hogg Robinson (London insurance broker with 20 percent of total capital).

(a) 100 percent locally owned companies to operate in its domestic market; and

(b) joint-venture companies with foreign interests in the Free Zone to write both foreign and Free Zone business.

Other developing countries have insurance markets with similar structures to those of the Arab world. According to a recent study by UNCTAD (1982, pp.8-15), there are at least 9 Asian and Pacific, 19 African, and 6 Latin American nations that have monopolistic insurance markets. The growth in the number of local companies and a decline in the foreign presence is also a feature of non-Arab developing countries. In addition, where foreign insurers are able to remain, their market shares usually decline.

Both monopolistic and highly competitive insurance markets have potential disadvantages for consumers. The dangers of creating an insurance monopoly are:

- a low quality of service for consumers;
- premium rates that in general are too high and insufficiently discriminate between different risks;
- Lack of product innovation and market expansion;
- Limited underwriting and retention capacity.

On the other hand, unrestricted entry to markets can lead to excessive competition leading to high marketing costs and the failure of under-capitalised companies. Therefore, there is a case for all Arab countries creating competitive markets but restricting the companies operating in any market to a number commensurate with the volume of business available. That could be achieved

by either supervisory regulations raising minimum capital requirements, or setting minimum premium incomes which new entrants would be required to achieve within a specified period. Either type of regulation would force certain companies in some Arab countries either to leave the market or merge with other companies.

3.4 Problems of the Insurance Market

The following major problems are commonly found in Arab insurance markets:

1. Lack of effective insurance legislation and insurance supervision. There are very significant differences in the legislation in different Arab countries. Chapter four will discuss the problem of insurance regulation and its effect on the development of insurance business.

2. Lack of trained company staff. This is a problem for all Arab insurance markets, though to some extent it varies between countries. The major shortcomings lie in the need to develop middle management and technical staff. Efforts towards training staff are being made in this area, but inevitably much time is needed to acquire good practical experience.

3. There is still great difficulty in compiling premium rates, and in many Arab countries insurance policies are written in foreign languages.

4. Effective claims management often suffers from the negligence of policyholders who delay in reporting accidents or provide tendentious accounts of them.

5. The markets suffer from bad organization and from lack of co-operation between companies. In some countries there are a large number of companies (domestic and foreign) operating in a relatively small market in terms of premium income, whilst elsewhere there is only one domestic company dominating the whole market.

6. An acute problem for some Arab insurance markets is the excessive competition between insurers, which in some cases has forced premium rates below the technical rate.

7. The rapid development in many Arab countries has created imbalanced insurance portfolios, because much of the business is either motor or large risks, rather than medium sized commercial business, resulting in high exposures and complexity of risks. This obliges all insurers to reinsure heavily abroad.

8. A lack of insurance consciousness. Many people are still not aware of the benefits of insurance; consequently insurance expenditure in the Arab world as a whole remains low.

9. Many millions of Moslems still regard insurance as contrary to the tenets of their faith, and full social acceptance of insurance will not occur until it is more widely understood by the mass of people.

3.5 Continued Activity of the Arab Insurance Market

Since the formation of the General Arab Insurance Federation

(G.A.I.F.) in 1964, the Arab countries have intended to fulfil a number of initial objectives, of which the most important was the retention of a larger proportion of premium income either within the country of origin or at least within the Arab world. A number of measures at local and regional level have been adopted, including:

1. The nationalization of insurance in Egypt (1961), Syria (1963), Iraq (1964), Algeria, (1967), Libya (1969), Southern Yemen (1970), Somalia (1972), Sudan (1970) and Mauritania (1973). However these were political moves being part of a general process of the nationalisation of wide sectors of the economy.
2. The domestication of insurance markets. Insurance companies operating in Morocco, and Tunisia must be wholly owned by nationals. In Kuwait only locally owned companies are now allowed to enter the market, and only domestic insurers can write government business.
3. The formation of national reinsurance companies to receive cessions, either voluntarily or compulsorily, from the local direct insurers. At present there are seven national reinsurance companies in the region, in Egypt (formed in 1957), Iraq (1960), Morocco (1961), Kuwait (1972), Sudan (1974), Algeria (1975), and Tunisia (1981).
4. The formation of reinsurance pools to achieve a greater degree of co-operation among Arab insurers and reinsurers, and better utilisation of Arab capacity by local business. The Aviation and Engineering pool were formed in 1968, the Fire pool in 1971, the Marine cargo pool in 1972, and the Marine Hull pool in 1974. Both Arab reinsurance pools and reinsurance

companies, will be examined in detail in Chapter seven.

5. The formation of the following Arab regional reinsurance companies:

- the Arab Reinsurance Company was established in Beirut in 1972 and owned by the national companies which are members of the G.A.I.F.
- the Arab Union Reinsurance Company was formed in 1976 in Damascus by the governments of Egypt, Libya and Syria. Following the 1978 boycott, Egypt withdrew from the Arab Union Re.
- the Mediterranean Insurance and Reinsurance Company, established in London in 1978 by the governments of Algeria and Libya.
- the Arab Insurance Groups was formed in Bahrain in 1980 by the governments of Kuwait, Libya and U.A.E, and is backed by U$ 3 billion of capital, of which U$ 150 million is paid up.

6. Joint arrangements have been established to insure the joint venture Arab projects listed below. Insurance of some Arab airlines and shipping fleets has also been arranged on joint slips. In doing so, Arab insurers are aiming to provide adequate rates for the insured and to utilise the available Arab capacity.

- The Arab Shipbuilding and Repair Yard Company at Bahrain.
- The Arab Maritime Petroleum Transport Company.
- The Iraqi, Jordanian and Syrian Airlines.
- The United Arab Emirates Shipping Company.
- The Algerian, Libyan, Mauritanian, Morocco, and Tunisian Airlines.

- The Moroccan and Tunisian Shipping Companies.

3.6 Development of Insurance Business

As indicated in Chapter two, the realignment of oil prices, resulting in a considerable increase in oil revenues to the Arab oil producing countries, has enabled those countries to allocate substantial sums for development projects and larger appropriations for consumer goods. Because of this development, insurance has been required and provided for various classes of business. As economic activities have grown, so insurance has developed in regards to both the types of risk covered, as well as in the size of premium income.

The rapid growth in premium volume of the Arab insurance markets during the second half of the 1970s is shown in table 3.7 and figure 3.2. Unfortunately, reliable figures on the Saudi Arabia market are unavailable. However, Arab and international insurance experts, when questioned, estimated that the premium income for Saudi Arabia was at least U$ 1200 million in 1979; that is, over one-third of total Arab premium income.

The growth of premium incomes (at local currencies) over the years 1974-1979 (shown in table 3.8), reflect high rates of inflation but, with the sole exception of Sudan, the annual average rates of inflation during the period were much less than those of premium income. Clearly the region experienced substantial real growth of premium income.

Generally, the demand for insurance has an income elasticity

Table 3.7

Arab Direct Premium Income for the Period 1974-79
(U.S Million)

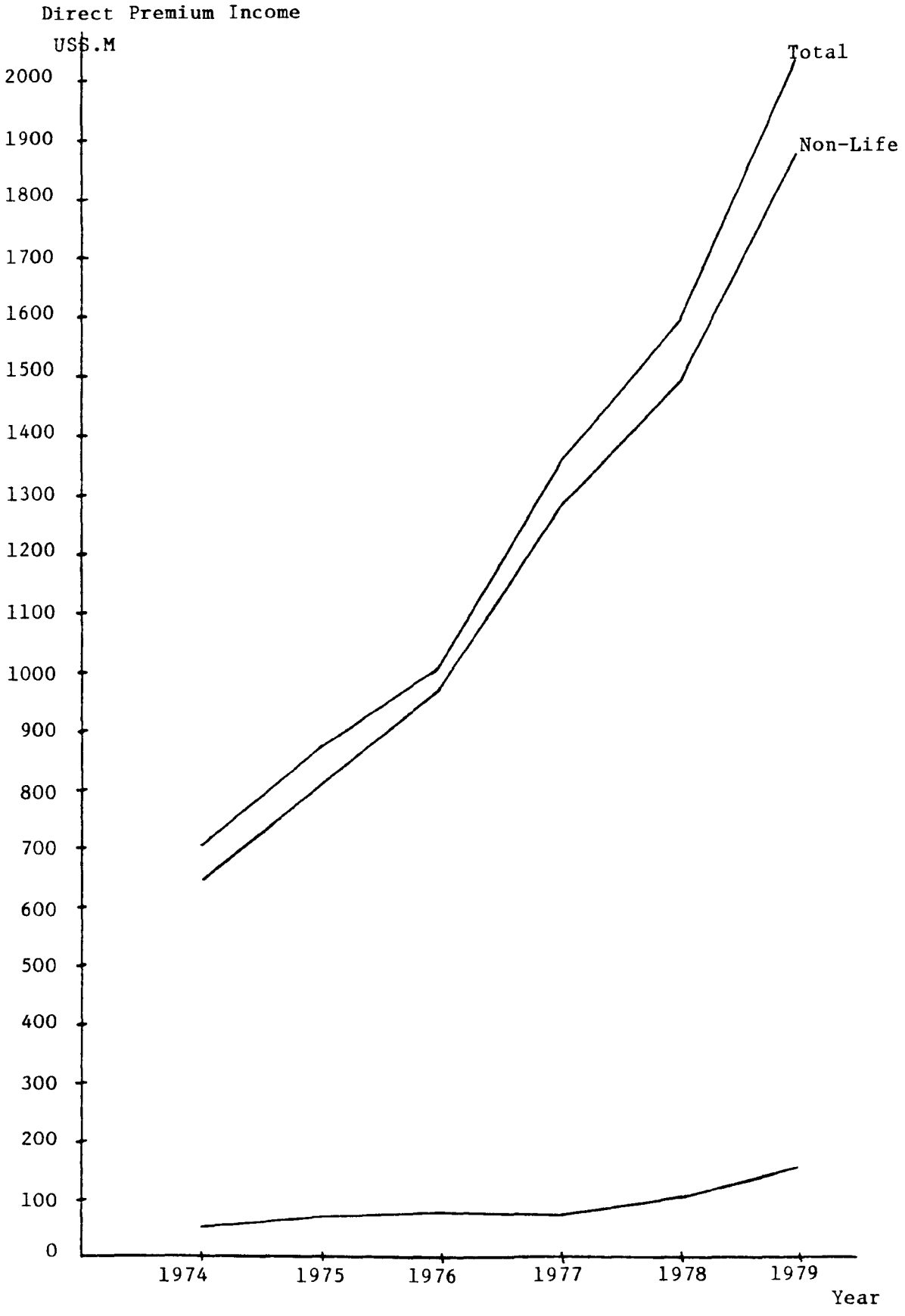
Country	1974			1975			1976			1977			1978			1979		
	Non-life	Life	Total	Non-life	Life	Total	Non-life	Life	Total	Non-life	Life	Total	Non-life	Life	Total	Non-life	Life	Total
Algeria	125.5	3.0	128.5	150.6	5.4	156.0	170.0	6.0	176.0	208.8	6.5	215.3	263.2	11.8	275.0	325.4	24.2	349.6
Bahrain	2.9	0.4	3.3	4.9	0.6	5.5	8.5	0.7	9.2	15.1	-	15.1	16.1	-	16.1	21.5	-	21.5
Egypt	74.6	23.0	97.6	97.9	26.0	123.9	111.2	29.4	140.6	72.7	18.5	91.2	100.0	22.0	122.0	141.2	27.2	168.4
Iraq	78.1	5.8	83.9	121.9	8.8	130.7	147.3	10.8	158.1	161.2	11.4	174.7	176.7	16.1	192.8	271.2	18.6	289.8
Jordan	7.5	1.7	9.2	10.3	2.0	12.3	17.4	2.2	19.6	24.7	5.0	29.7	28.0	6.0	34.0	36.3	6.8	43.1
Kuwait	47.1	5.8	52.9	65.5	4.6	70.1	88.0	7.0	95.0	149.4	8.8	158.2	175.0	16.8	191.8	203.7	18.5	222.2
Lebanon	32.0	-	32.5	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	27.2	7.6	34.8
Libya	75.0	0.4	75.4	88.7	0.5	89.2	92.3	0.8	93.1	118.2	-	118.2	131.7	-	131.7	154.4	4.2	158.6
Mauritania	n.a	n.a	n.a	3.0	-	3.0	3.5	-	3.5	3.0	-	3.0	4.0	-	4.0	5.0	-	5.0
Morocco	106.1	12.3	118.4	122.0	15.5	137.5	140.4	18.8	159.2	188.0	16.5	204.5	227.0	18.0	245.0	269.0	41.8	310.8
Oman	4.0	-	4.0	5.0	-	5.0	8.0	-	8.0	28.6	-	28.6	31.4	-	31.4	40.0	-	40.0
Qatar	7.0	-	7.0	9.3	-	9.3	11.6	-	11.6	45.3	-	45.3	47.8	-	47.8	47.4	-	47.4
Saudi Arabia	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a
Somalia	3.9	-	3.9	3.9	-	3.9	5.3	-	5.3	6.6	-	6.6	8.0	-	8.0	9.1	-	9.1
Sudan	14.8	1.0	15.8	22.5	1.2	23.7	24.6	1.4	26.0	22.0	2.0	24.0	25.0	2.7	27.7	26.6	1.0	27.6
Syria	15.8	0.2	16.0	24.8	0.3	25.1	35.7	0.5	36.2	34.7	0.8	35.5	36.2	1.0	37.2	52.5	1.0	53.5
Tunisia	36.1	1.2	37.3	48.2	1.5	49.7	56.0	2.0	58.0	73.9	5.0	78.9	78.1	5.5	83.6	104.4	6.5	110.9
U.A.E.	12.6	-	12.6	23.2	0.4	23.6	32.5	1.0	33.5	95.2	1.2	96.4	108.2	1.5	109.7	133.3	-	133.3
Yemen(N)	0.5	-	0.5	1.7	-	1.7	3.8	-	3.8	6.5	-	6.5	8.7	-	8.7	11.8	-	11.8
Yemen(S)	2.5	0.2	2.7	2.1	0.1	2.2	3.2	0.1	3.3	19.0	0.3	19.3	21.7	0.6	22.3	n.a	n.a	n.a
Total	646.5	55.0	701.5	805.5	66.9	872.4	959.3	80.7	1040.0	1274.9	76.0	1350.9	1486.8	102.0	1588.8	1880.0	157.4	2037.4

Source: (1) Iraq Reinsurance Co. (1976 and 1979).

(2) Rajab, M. (1981).

Figure 3.2

Arab Direct Premium Income for the Period 1974-79



Source: Table 3.7

Table 3.8

Growth Rates of Direct Premium Income 1974-79 in local currencies millions

Country	1974			1979			Average Annual Growth Rate 1974-79			Average Annual Growth Rate of Inflation 1974-79
	Non-life	Life	Total	Non-life	Life	Total	Non-life	Life	Total	
Algeria	524.7	12.5	537.2	1253.9	93.2	1347.1	19.0	49.5	20.2	11.7
Bahrain	1.2	0.2	1.4	8.1	-	8.1	46.5	-	42.1	14.7
Egypt	29.2	9.0	38.2	98.8	19.0	117.8	27.6	16.1	25.3	10.8 N2
Iraq	23.1	1.7	24.8	80.1	5.5	85.6	28.2	26.5	28.1	9.0
Jordan	2.4	0.8	3.2	10.9	2.0	12.9	35.3	20.1	32.2	11.8
Kuwait	13.8	1.7	15.5	56.3	5.1	61.4	32.5	24.6	31.7	7.4
Lebanon	74.5	-	74.5	88.2	24.6	112.8	3.4	-	8.7	n.a
Libya	22.2	0.1	22.3	45.7	1.3	47.0	15.5	67.0	16.1 N1	15.1 N2
Mauritania	n.a	n.a	n.a	229.5	-	229.5	15.4	-	15.4	10.6
Morocco	463.6	53.7	517.3	1048.9	163.0	1211.9	17.7	24.9	18.7	9.4
Oman	1.4	-	1.4	13.8	-	13.8	58.0	-	58.0	n.a
Qatar	27.6	-	27.6	178.8	-	178.8	45.3	-	45.3	n.a
Saudi Arabia	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a
Somalia	24.6	-	24.6	57.3	-	57.3	18.4	-	18.4	15.5
Sudan	5.2	0.4	5.6	11.3	0.4	11.7	16.8	-	15.9	18.2
Syria	59.0	0.8	59.8	206.1	3.9	210.0	28.4	37.3	28.6	8.8
Tunisia	15.8	0.5	16.3	42.4	2.6	45.0	21.8	39.1	22.5	6.9
U.A.E.	50.0	-	50.0	508.6	-	508.6	59.0	-	59.0	n.a
Yemen(N)	2.3	-	2.3	53.8	-	53.8 N3	87.8	-	87.8	18.2
Yemen(S)	0.9	0.1	1.0	3.0	0.1	3.1	27.2	-	25.4	6.6
							31.8	33.9	31.5	11.6

N1: Growth rate for 1975-79
N2: Growth rate for 1974-78
N3: GAIF, 13th General Meeting, Amman, Jordan, 1980
Source:(1) As for table 3.7
(2) IMF (1981)

Note: Inflation = percentage change in consumer prices.

of demand greater than one, so that it responds directly to the fluctuations of the economic cycle. A study by the Swiss Reinsurance Company, the results of which are shown in figure 3.3, revealed that world-wide real premium income declined during the two periods of global recession in 1974-75 and 1979. However, given the substantial economic development that occurred in the oil-producing countries following the large oil price increases of 1973 and 1979, the real premium income of the Arab world continued to grow throughout the 1970s.

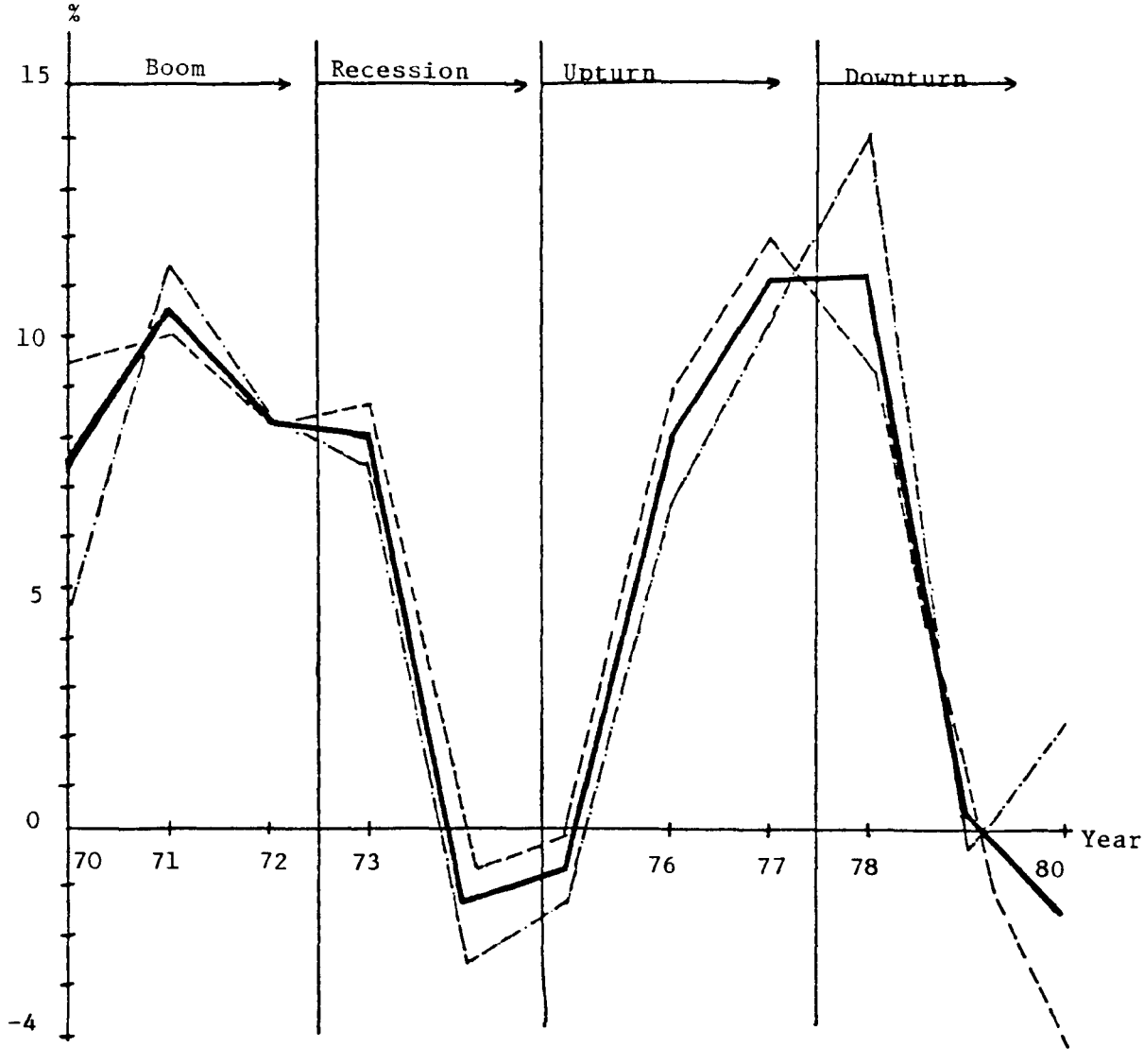
A more detailed review of the development of the Arab insurance markets in relation to the rest of the world is provided by tables 3.9 to 3.11.

Even if the estimated premium income for Saudi Arabia was added to the Arab world total in table 3.9, it would still mean the Arab region, with a total population of 168 million people, generates only 0.82 per cent of the total world premium income (excluding the communist bloc). That is approximately the same as Spain, one of the poorest European countries, with a population of only 37 millions. Expenditure per capita on life insurance is particularly low in Arab countries compared with developed countries.

Table 3.10 shows that the fastest rate of premium growth during the 1970s was achieved in non-OECD countries, including the Arab countries, though in 1980 the Third World still accounted for only 5 per cent of world premium income. More than half of the Third World's premiums are generated by the fifteen largest insurance markets (excluding Saudi Arabia) shown in table 3.11.

Figure 3.3

Real Premium Growth over the Economic Cycle:
Total, Life and Non-Life Business



Total _____

Life -·-·-·-·-·-

Non-life -------

Source: (Sigma, No. 11, 1981, p.3.)

Table 3.9

Gross Direct Premium Income in 1974 and 1979
(U $ billions)

Country Group	1974						1979					
	Non-life	% to world	Life	% to world	Total	% to world	Non-life	% to world	Life	% to world	Total	% to world
North America	60	51.88	35	45.42	95	49.30	118	48.95	57	37.46	175	44.50
EEC	32	27.67	19	24.66	51	26.47	70	29.03	43	28.26	113	28.74
OECD	19	16.43	20	25.96	39	20.24	40	16.59	46	30.23	86	21.87
Rest of the World[1]	4	3.46	3	3.89	7	3.63	10	4.15	6	3.95	16	4.07
Sub-Total	115	99.44	77	99.93	192	99.64	238	98.72	152	99.90	390	99.18
Arab World	0.646	0.56	0.055	0.07	0.701	0.36	3.080[3]	1.28	0.157	0.10	3.237	0.82
Total[2]	115.646	100.00	77.055	100.00	192.701	100.00	241.080	100.00	152.157	100.00	393.237	100.00

Source: (a) Compiled from Swiss Re, Sigma Nos. 5, 1976 and 1981.
(b) Table 3.7.

Note: (1) Excluding Arab countries.
(2) Excluding Communist countries.
(3) Saudi Arabia figures are included.

Table 3.10

World Shares of Premium Income and their Growth Rates (1970 and 1980). (U. $ Billion)

Country Group	1970				1980				Average Annual growth rate 1970/80		
	Non-life	Life	Total	% in world volume	Non-life	Life	Total	% in world volume	Non-life	Life	Total
EEC	14.680	9.321	24.001	21.2	71.895	45.888	117.783	27.3	17.2	17.3	17.2
Rest of Europe	2.505	1.384	3.889	3.4	13.974	8.637	22.611	5.3	18.8	20.1	19.3
North America	44.714	27.146	71.860	63.5	132.268	69.943	202.211	47.0	11.5	9.9	10.9
Japan	2.930	5.033	7.963	7.0	18.666	40.513	59.179	13.7	20.3	23.2	22.2
Rest of OECD	1.126	0.962	2.088	1.9	4.575	2.806	7.381	1.7	15.0	11.3	13.5
OECD	65.955	43.846	109.801	97.0	241.378	167.787	409.165	95.0	13.9	14.4	14.1
Non-OECD	1.950	1.396	3.346	3.0	13.881	7.490	21.371	5.0	21.7	18.3	20.4
World Total	67.905	45.242	113.147	100.0	255.259	175.277	430.536	100.0	14.2	14.5	14.3

Source: Swiss Re, Sigma, No. 2, 1983.

Table 3.11

The Leading Accounts in the Third World Insurance Markets: 1980 Premiums (US $ millions)

Country	Non-life	Life	Total	Share in world volume
India	592	1,201	1,793	0.41
Brazil	1,482	280	1,762	0.41
Mexico	1,070	439	1,509	0.35
South Korea	587	915	1,502	0.35
Venezuela	901	209	1,110	0.26
Nigeria	546	137	683	0.16
Taiwan	271	326	597	0.14
Philippines	281	203	484	0.11
Malaysia	328	145	473	0.11
Algeria	414	42	456	0.10
Iran	358	20	378	0.09
Colombia	293	81	374	0.09
Indonesia	239	96	335	0.08
Morocco	274	42	316	0.07
Thailand	154	136	290	0.07
Total	7,790	4,272	12,062	2.8

Source: Swiss Re, Sigma, No. 5, 1982, pp.10-12.

3.7 Premium Expenditure and Insurance Density.

The size of per capita premiums in various countries provides a good picture of the state of development of their national insurance industries. However, it should be borne in mind that per capita premiums may be affected by various factors, such as:

1. The degree of economic development, including industrialisation and motorisation;
2. The growth of population, which in conjunction with 1. determines;
3. GNP per capita;
4. The degree of inequality in the distribution of income; and
5. How far the people are insurance conscious.

In most Third World countries the GNP per capita and the degree of industrialisation are often limited. This is coupled with a relatively high population growth rate and a low level of insurance awareness. Also the insurance market is often restricted to the major cities and therefore the per capita premiums are not necessarily of great informative value.

Premium expenditure per capita in the Arab World is still small, as shown in table 3.12. The figures in this table show that the highest levels of premium per capita expenditure occur in the smallest Gulf States in terms of population, notably Kuwait, Qatar and U.A.E.

Table 3.13 shows premiums per capita in the Arab World compared with other regions of the world. There is a marked difference in the premiums per capita between developed and developing countries.

Table 3.12

Premium Per Head of Population 1974-1979 (US dollar)

Country	1974			1975			1976			1977			1978			1979		
	Non-life	Life	Total	Non-life	Life	Total	Non-life	Life	Total	Non-life	Life	Total	Non-life	Life	Total	Non-life	Life	Total
Algeria	7.7	0.2	7.9	9.0	0.3	9.3	9.8	0.4	10.2	11.7	0.4	12.1	15.0	0.7	15.7	17.9	1.3	19.2
Bahrain	11.6	1.6	13.2	18.8	2.3	21.1	31.5	2.6	34.1	55.9	-	55.9	57.5	-	57.5	74.1	-	74.1
Egypt	2.1	0.6	2.7	2.6	0.7	3.3	2.9	0.8	3.7	1.9	0.5	2.4	2.5	0.6	3.1	3.4	0.7	4.1
Iraq	7.3	0.5	7.8	11.0	0.8	11.8	12.8	0.9	13.7	13.6	1.0	14.6	14.3	1.3	15.6	21.2	1.5	22.7
Jordan	2.9	0.7	3.6	3.8	0.7	4.5	6.3	0.8	7.1	8.5	1.7	10.2	9.3	2.0	11.3	11.6	2.2	13.8
Kuwait	50.1	6.2	56.3	64.9	4.6	69.5	82.2	6.5	88.7	131.1	7.7	138.8	144.6	13.9	158.5	157.9	14.3	172.2
Lebanon	11.7	-	11.7	-	-	-	-	-	-	-	-	-	-	-	-	10.2	2.9	13.1
Libya	32.2	0.2	32.4	36.5	0.2	36.7	36.5	0.3	36.8	44.9	-	44.9	48.1	-	48.1	54.0	1.5	55.5
Mauritania	-	-	-	2.2	-	2.2	2.4	-	2.4	2.0	-	2.0	2.6	-	2.6	3.2	-	3.2
Morocco	6.3	0.7	7.0	7.1	0.9	8.0	7.9	1.1	9.0	10.2	0.9	11.1	12.0	1.0	13.0	13.8	2.0	15.8
Oman	5.4	-	5.4	6.5	-	6.5	10.1	-	10.1	35.3	-	35.3	37.4	-	37.4	46.5	-	46.5
Qatar	43.8	-	43.8	54.7	-	54.7	61.1	-	61.1	226.5	-	226.5	227.6	-	227.6	206.1	-	206.1
Saudi Arabia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Somalia	1.3	-	1.3	1.2	-	1.2	1.6	-	1.6	1.8	-	1.8	2.0	-	2.0	2.1	-	2.1
Sudan	1.0	0.1	1.1	1.4	0.1	1.5	1.5	0.1	1.6	1.3	0.1	1.4	1.4	0.2	1.6	1.5	0.1	1.6
Syria	2.2	0	2.2	3.3	0	3.3	4.6	0.1	4.7	4.3	0.1	4.4	4.4	0.1	4.5	6.1	0.1	6.2
Tunisia	6.6	0.2	6.8	8.6	0.3	8.9	9.7	0.4	10.1	12.5	0.8	13.3	12.8	0.9	13.7	16.7	1.0	17.7
U.A.E.	28.0	-	28.0	45.5	0.8	46.3	58.0	1.8	59.8	156.1	2.0	158.1	166.5	2.3	168.8	193.2	-	193.2
Yemen (N)	0.1	-	0.1	0.3	-	0.3	0.7	-	0.7	1.2	-	1.2	1.6	-	1.6	2.1	-	2.1
Yemen (S)	1.5	0.1	1.6	1.2	0.1	1.3	1.8	0.1	1.8	10.9	0.2	10.8	11.7	0.3	12.0	-	-	-
	4.7	0.4	5.1	5.7	0.5	6.2	6.6	0.6	7.2	8.5	0.5	9.0	9.7	0.7	10.4	11.9	1.0	12.9

Sources: Premiums - Table 3.7

Population - Table 2.1A Chapter two.

The comparison leaves no doubt that the rest of the world, as well as the Arab world, are different, and per capita premiums are much lower than those in the O.E.C.D.[1]. Despite the considerable progress in many countries outside the O.E.C.D., the insurance expenditure is still small and will remain, for the foreseeable future, tiny by European standards, due to the low income per capita. Having said that, in the non-O.E.C.D, growth rate of premiums per capita has recently shown signs of being faster than that of the O.E.C.D.

Table 3.13

The World-Wide Per Capita Premiums 1974-79[2]

Country Group	1974			1979			Average Annual Growth Rate 1974-79
	Non-life	Life	Total	Non-life	Life	Total	
North America	283.0	165.1	448.1	526.8	254.5	781.3	11.8
EEC	119.9	72.2	192.1	259.8	158.7	418.5	16.9
Other OECD	73.3	74.1	147.4	142.8	164.1	306.9	15.8
Total OECD	150.0	99.4	249.4	295.2	188.5	483.7	14.2
Rest of the World	3.4	2.2	5.6	7.1	4.4	11.5	15.5
Arab World	4.7	0.4	5.7	11.9	1.0	12.9	17.7
Total World	56.9	37.5	94.4	103.9	65.8	169.7	12.4

* Excluding Communist countries.

Sources: Compiled from:
(1) Swiss Re, Sigma Nos. 5 1976 and 1981 (premiums)
(2) The World Bank Atlas, 1976 and 1981 (population).
(3) Table 3.6 and Table 2.1, Chapter two for the Arab World.

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(1) In 1980 for example, notable exceptions were Kuwait with US$177.77, Argentina with US$123.09, South Africa with US$120.36, and Singapore with US$120.09 where the per capita premiums were considerably higher than in Spain (US$90.15), Portugal (US$61.98) Greece (U $41.80) and Turkey (U $3.68) (Sigma, No. 2, 1983).

(2) The population of the regions under the study for the year 1974 and 1979 stood at:

	1974	1979
North America	212 million	224 million
EEC	267 m.	269 m
OECD	263 m	268 m
Rest of the World	1157 m	1276 m
Arab World	137 m	164 m

Source: (1) World Bank Atlas, 1976 and 1981.

(2) Table 2.1 Chapter two for the Arab Countries.

A direct comparison of the growth of premium expenditure per capita in each of the Arab countries with that in one of the world's most developed insurance markets, the United States of America, during 1974-79 is provided by tables 3.14 and 3.15 using the following equation:

$$C = \frac{P_x}{P_A} \Big/ \frac{Y_x}{Y_A}$$

where C = the coefficient of insurance expenditure relative to that in the USA

P_x = premium expenditure per capita in Arab country x.

P_A = premium expenditure per capita in the U.S.A.

Y_x = GNP per capita in Arab country x.

Y_A = GNP per capita in the U.S.A.

Thus the table shows:

(a) the comparative levels of GNP and premium expenditure per capita in each Arab country for each year compared with the U.S.A.

(b) What progress, or otherwise, each of the Arab countries made over the period compared with the U.S.A. in relation to both income and premium expenditure; and

(c) Whether premium expenditure relative to income per capita in each Arab country is less than ($C < 1$) or greater than ($C > 1$) in the U.S.A.

From table 3.14 it can be seen that income per capita in the Arab World grew faster than income per capita of the U.S. In some cases for example, Kuwait, Qatar and U.A.E. it went up substantially due to the high oil revenues. Only in Mauritania it fell from 4.35 in 1974 to 2.83 in 1979. There can be no doubt that over the same period, premium per capita in the Arab World grew

Table 3.14

GNP Per Capita and Premium Expenditure per Capita in the Arab World
Compared With the United States of America

Country	1974			1975			1976			1977			1978			1979		
	$\frac{Y_x}{Y_A}$ *	$\frac{P_x}{P_A}$ *	C	$\frac{Y_x}{Y_A}$	$\frac{P_x}{P_A}$	C	$\frac{Y_x}{Y_A}$	$\frac{P_x}{P_A}$	C	$\frac{Y_x}{Y_A}$	$\frac{P_x}{P_A}$	C	$\frac{Y_x}{Y_A}$	$\frac{P_x}{P_A}$	C	$\frac{Y_x}{Y_A}$	$\frac{P_x}{P_A}$	C
Algeria	10.94	1.76	0.16	12.22	1.88	0.15	12.82	1.77	0.14	13.02	1.81	0.15	12.99	2.14	0.16	16.68	2.42	0.15
Bahrain	35.23	2.93	0.08	31.04	4.26	0.14	48.35	5.93	0.12	46.29	8.37	0.18	42.27	7.83	0.19	48.54	9.32	0.19
Egypt	4.20	0.60	0.14	3.65	0.67	0.18	3.55	0.64	0.18	3.89	0.36	0.09	4.12	0.42	0.10	4.71	0.52	0.11
Iraq	16.64	1.74	0.10	17.56	2.38	0.14	17.63	2.38	0.13	17.94	2.18	0.12	19.18	2.12	0.11	25.54	2.86	0.11
Jordan	6.40	0.80	0.13	6.46	0.91	0.14	8.25	1.23	0.15	10.74	1.53	0.14	10.82	1.54	0.14	11.31	1.74	0.15
Kuwait	150.37	12.54	0.08	213.34	14.05	0.07	177.16	15.43	0.09	145.03	20.79	0.14	153.51	21.60	0.14	193.40	21.66	0.11
Lebanon	16.04	-		15.07	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a
Libya	66.57	7.22	0.11	77.67	7.42	0.10	75.76	6.4	0.08	74.51	6.73	0.09	71.24	6.55	0.09	79.92	6.98	0.09
Mauritania	4.35	-	-	4.49	0.44	0.10	3.17	0.42	0.13	3.08	0.30	0.10	2.78	0.35	0.13	2.83	0.40	0.14
Morocco	6.45	1.56	0.24	6.60	1.62	0.25	6.60	1.56	0.24	6.97	1.66	0.24	6.90	1.77	0.26	7.35	1.99	0.27
Oman	24.89	1.20	0.05	32.30	1.31	0.04	33.24	1.76	0.05	28.69	5.29	0.18	26.49	5.10	0.19	33.27	5.85	0.18
Qatar	108.85	9.76	0.09	153.93	11.05	0.07	147.72	10.63	0.07	129.94	33.93	0.26	131.34	31.01	0.24	188.69	25.92	0.14
Saudi Arabia	42.43	-	-	56.32	n.a	n.a	56.09	n.a	n.a	82.63	n.a	n.a	82.89	n.a	n.a	93.87	n.a	n.a
Somalia	1.35	0.29	0.21	1.54	0.24	0.16	1.40	0.28	0.20	1.37	0.27	0.20	1.34	0.27	0.20	n.a	n.a	n.a
Sudan	3.45	0.24	0.07	3.79	0.30	0.08	3.43	0.28	0.08	3.77	0.21	0.06	3.30	0.22	0.07	4.24	0.20	0.05
Syria	8.40	0.49	0.06	10.11	0.67	0.07	10.53	0.82	0.08	9.83	0.66	0.07	9.59	0.61	0.06	11.03	0.78	0.07
Tunisia	9.75	1.51	0.15	10.25	1.80	0.18	10.15	1.76	0.17	9.60	1.99	0.21	9.80	1.87	0.19	10.93	2.23	0.20
U.A.E.	165.82	6.24	0.04	191.01	9.36	0.05	183.76	10.40	0.06	169.14	23.69	0.14	146.70	23.00	0.16	220.64	24.30	0.11
North Yemen	2.70	0.02	0.01	2.80	0.06	0.02	3.81	0.12	0.03	5.82	0.18	0.03	5.98	0.22	0.04	3.96	0.26	0.07
South Yemen	3.30	0.36	0.11	3.51	0.26	0.07	3.43	0.33	0.10	4.00	1.62	0.41	4.33	1.64	0.38	3.49	-	-

Note: * : $\frac{Y_x}{Y_A}$ and $\frac{P_x}{P_A}$ are shown as a percentage, i.e. $\frac{Y_x}{Y_A} \times 100$

United States

	GNP per capita	Premium per capita Life and Non Life
1974	US6670	US449.0
1975	7120	494.8
1976	7880	575.0
1977	8750	667.5
1978	9700	733.9
1979	10610	795.0

Source: 1. The World Bank Atlas, different issues.
2. Sigma, different issues.

Table 3.15

GNP Per Capita and Premium Expenditure Per Capita of Non -life Insurance
Compared With the United States of America

Country	1974			1975			1976			1977			1978			1979		
	$\frac{Y_x}{Y_A}$ *	$\frac{P_x}{P_A}$ *	C	$\frac{Y_x}{Y_A}$	$\frac{P_x}{P_A}$	C	$\frac{Y_x}{Y_A}$	$\frac{P_x}{P_A}$	C	$\frac{Y_x}{Y_A}$	$\frac{P_x}{P_A}$	C	$\frac{Y_x}{Y_A}$	$\frac{P_x}{P_A}$	C	$\frac{Y_x}{Y_A}$	$\frac{P_x}{P_A}$	C
Algeria	10.94	2.81	0.26	12.22	3.00	0.25	12.82	2.80	0.22	13.02	2.73	0.21	12.99	3.19	0.25	16.68	3.58	0.21
Bahrain	35.23	4.69	0.13	31.04	6.81	0.22	48.35	9.37	0.19	46.29	12.63	0.27	42.27	11.69	0.28	48.54	13.82	0.28
Egypt	4.20	0.96	0.23	3.65	1.06	0.29	3.55	1.01	0.28	3.89	0.54	0.14	4.12	0.63	0.15	4.71	0.76	0.16
Iraq	16.64	2.77	0.17	17.56	3.80	0.22	17.63	3.76	0.21	17.94	3.30	0.18	19.18	3.17	0.17	25.54	4.23	0.17
Jordan	6.40	1.28	0.20	6.46	1.45	0.22	8.25	1.95	0.24	10.74	2.30	0.21	10.82	2.30	0.21	11.31	2.57	0.23
Kuwait	150.37	2.00	0.01	213.34	22.43	0.11	177.16	24.37	0.14	145.03	31.35	0.22	153.51	32.23	0.21	193.40	32.11	0.17
Lebanon	16.04	4.16	0.26	15.02	-	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.	n.	n.a	n.a	n.a	n.a
Libya	66.57	11.51	0.17	77.67	11.85	0.15	75.76	10.11	0.13	74.51	10.14	0.14	71.24	9.78	0.14	79.92	10.35	0.13
Mauritania	4.35	n.a	n.a	4.49	0.71	0.16	3.17	0.66	0.21	3.08	0.45	0.15	2.78	0.53	0.19	2.83	0.60	0.21
Morocco	6.45	2.49	0.39	6.60	2.58	0.39	6.60	2.47	0.37	6.97	2.51	0.36	6.90	2.64	0.38	7.35	2.95	0.40
Oman	24.89	1.92	0.08	32.30	2.10	0.07	33.24	2.77	0.08	28.69	7.97	0.28	26.49	7.60	0.29	33.27	8.67	0.26
Qatar	108.85	15.56	0.14	153.93	17.66	0.11	147.72	16.78	0.11	129.94	51.16	0.39	131.34	46.28	0.35	188.69	38.44	0.20
Saudi Arabia	42.43	n.a	n.a	56.32	n.a	n.a	56.09	n.a	n.a	82.63	n.a	n.a	82.89	n.a	n.a	93.87	n.a	n.a
Somalia	1.35	0.46	0.34	1.54	0.39	0.25	1.40	0.44	0.31	1.37	0.41	0.30	1.34	0.41	0.31	n.a	0.39	n.a
Sudan	3.45	0.39	0.11	3.79	0.48	0.13	3.43	0.44	0.13	3.77	0.32	0.08	3.30	0.33	0.10	4.24	0.30	0.07
Syria	8.40	0.78	0.09	10.11	1.07	0.11	10.53	1.29	0.12	9.83	0.99	0.10	9.59	0.92	0.10	11.03	1.16	0.11
Tunisia	9.75	2.42	0.25	10.25	2.87	0.28	10.15	2.77	0.27	9.60	3.00	0.31	9.80	2.79	0.28	10.93	3.30	0.30
U.A.E.	165.82	9.95	0.06	191.01	14.95	0.08	183.76	16.43	0.09	169.14	35.71	0.21	146.70	34.32	0.23	220.64	36.03	0.16
North Yemen	2.70	0.04	0.01	2.80	0.10	0.04	3.81	0.19	0.05	5.82	0.27	0.05	5.98	0.33	0.06	3.96	0.39	0.10
South Yemen	3.30	0.57	0.17	3.51	0.42	0.12	3.43	0.52	0.15	4.00	2.44	0.61	4.33	2.44	0.56	3.49	n.a	n.a

Note: * : $\frac{Y_x}{Y_A}$ and $\frac{P_x}{P_A}$ are shown as a percentage, i.e. $\frac{Y_x}{Y_A}$ x 100

	United States Premium per capita of Non-life business
1974	U$281.5
1975	309.8
1976	364.0
1977	442.7
1978	491.8
1979	536.2

Source: Sigma, different issues.

rapidly. In some countries, the growth of premium per capita related to the U.S. rose at a slower rate. In Kuwait, Qatar and U.A.E. for instance, it was much higher than in the U.S. There is some evidence that the growth of premium expenditure per capita in relation to the GNP per capita in the Arab world grew more rapidly than in the U.S. This table also demonstrates that elasticity demand for insurance was greater than one, and three countries (i.e. Kuwait, Qatar and U.A.E.) had much higher elasticity than other Arab countries.

If only non-life business is considered for the purpose of this comparison, it can be seen that the growth of premium per capita, as well as premium per capita in relation to income per capita, in the Arab World was rather faster than in the U.S. as shown in table 3.15. This can be attributed to the fact that over the period 1974-79 the share of non-life business in total business was more than 90 percent in most Arab countries, while it was much lower in the U.S.

The empirical evidence indicates that one of the primary elements affecting per capita premiums is the level of per capita income in a country. When people have a relatively high income and there are more assets to protect, they tend to buy insurance because they are able to afford it. This hypothesis is illustrated in table 3.16 and the scatter diagrams shown in figures 3.4, 3.5, 3.6 and 3.7, which show the premium expenditure per capita for life and non-life business and the GNP per capita in fifty one countries. Logarithmic plotting was preferred to linear plotting as this method absorbs the large variation in the data of these countries.

Table 3.16
GNP Per Capita and Premium Exp. Per Capita (1980)

		(X)	Premium Exp. Per Capita (Y)	(Y)
		GNP per capita	Non-Life	Life
1.	Switzerland	16,440	492.8	467.8
2.	United States	11,360	548.8	284.9
3.	West Germany	13,590	383.3	270.6
4.	Netherlands	11,470	361.9	241.2
5.	Sweden	13,520	321.4	257.5
6.	Great Britain	7.920	269.0	285.7
7.	Canada	10,130	307.1	213.3
8.	Norway	12,650	336.7	176.5
9.	Finland	9,720	170.3	339.1
10.	Japan	9,890	159.9	347.0
11.	Denmark	12,950	296.7	205.8
12.	Australia	9,820	319.6	162.2
13.	Belgium	12,180	325.4	120.1
14.	France	11,730	305.9	113.3
15.	Austria	10,230	283.5	93.7
16.	Luxembourg	14,510	275.0	80.6
17.	Qatar	26,080	222.0	7.2
18.	U.A.E.	30,070	199.2	6.3
19.	Ireland	4,880	150.3	139.4
20.	New Zealand	7.090	135.2	123.8
21.	Kuwait	22,840	162.0	16.1
22.	Italy	6,480	110.4	16.7
23.	Argentina	2,390	115.2	8.0
24.	South Africa	2,290	34.6	86.5
25.	Singapore	4,480	86.6	32.2
26.	Spain	5,350	78.9	11.2
27.	Venezuela	3,630	64.8	15.0
28.	Portugal	2,350	56.7	4.9
29.	Uruguay	2,820	46.6	3.3
30.	Greece	4,520	37.0	6.5
31.	South Korea	1,520	15.4	24.0
32.	Malaysia	1,670	24.4	10.8
33.	Algeria	1,920	22.3	2.2
34.	Chile	2,160	17.8	4.7
35.	Ivory Coast	1,150	21.1	0.7
36.	Mexico	2,130	14.9	6.1
37.	Tunisia	1,310	16.5	1.1
38.	Morocco	860	13.7	2.1
39.	Iraq	3,020	12.8	1.5
40.	Brazil	2,050	12.0	2.3
41.	Colombia	1,180	10.8	3.0
42.	Kenya	420	8.5	2.8
43.	Philippines	720	5.8	4.2
44.	Nigeria	1,010	7.1	1.8
45.	Peru	930	7.9	0.5
46.	Thailand	670	3.3	2.8
47.	Egypt	580	3.6	0.8
48.	Turkey	1,460	3.6	0.1
49.	India	240	0.9	1.8
50.	Indonesia	420	1.6	0.6
51.	Pakistan	300	1.3	0.7

Source: (1) GNP per capita - World Bank Atlas 1981.
(2) Premium per capita - Sigma, No. 2, 1983, except Qatar and U.A.E.

Figure 3.4

Non-Life Premium Income Per Capita and GNP Per Capita (1980)
51 countries

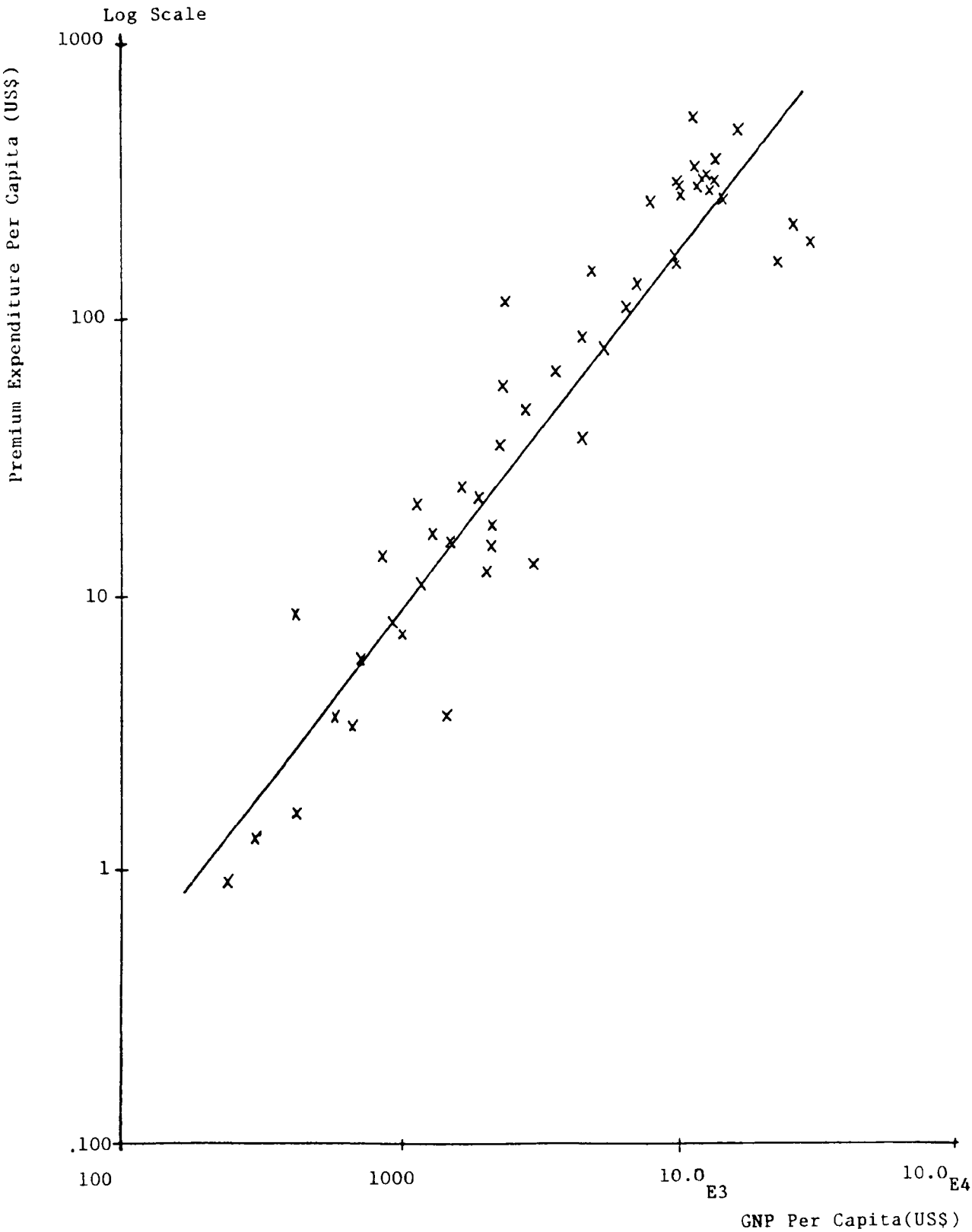


Figure 3.5

Life Premium Income Per Capita and GNP Per Capita (1980)
51 Countries

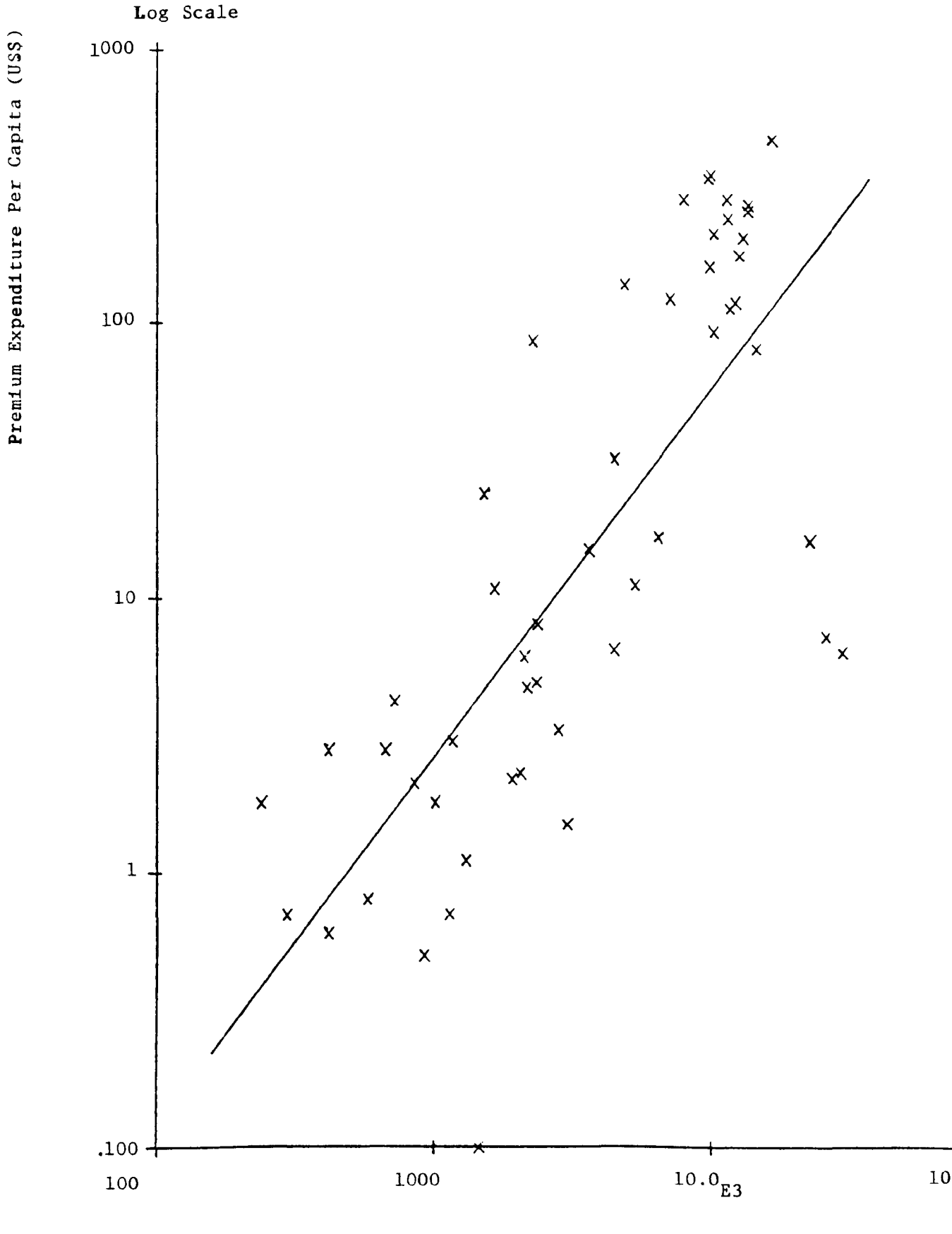


Figure 3.6

Non-Life Premium Income Per Capita and GNP Per Capita (1980)
8 Arab Countries

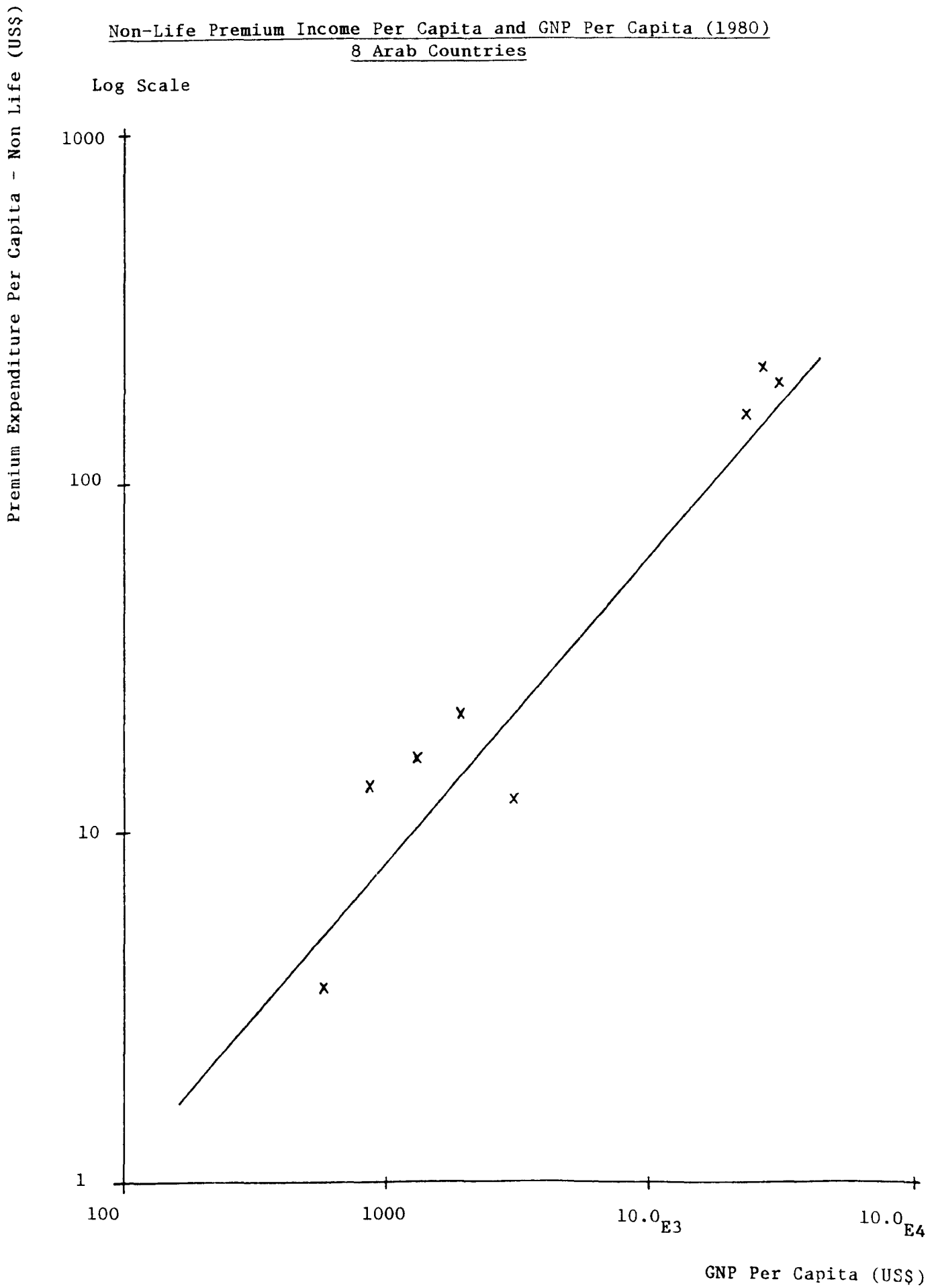
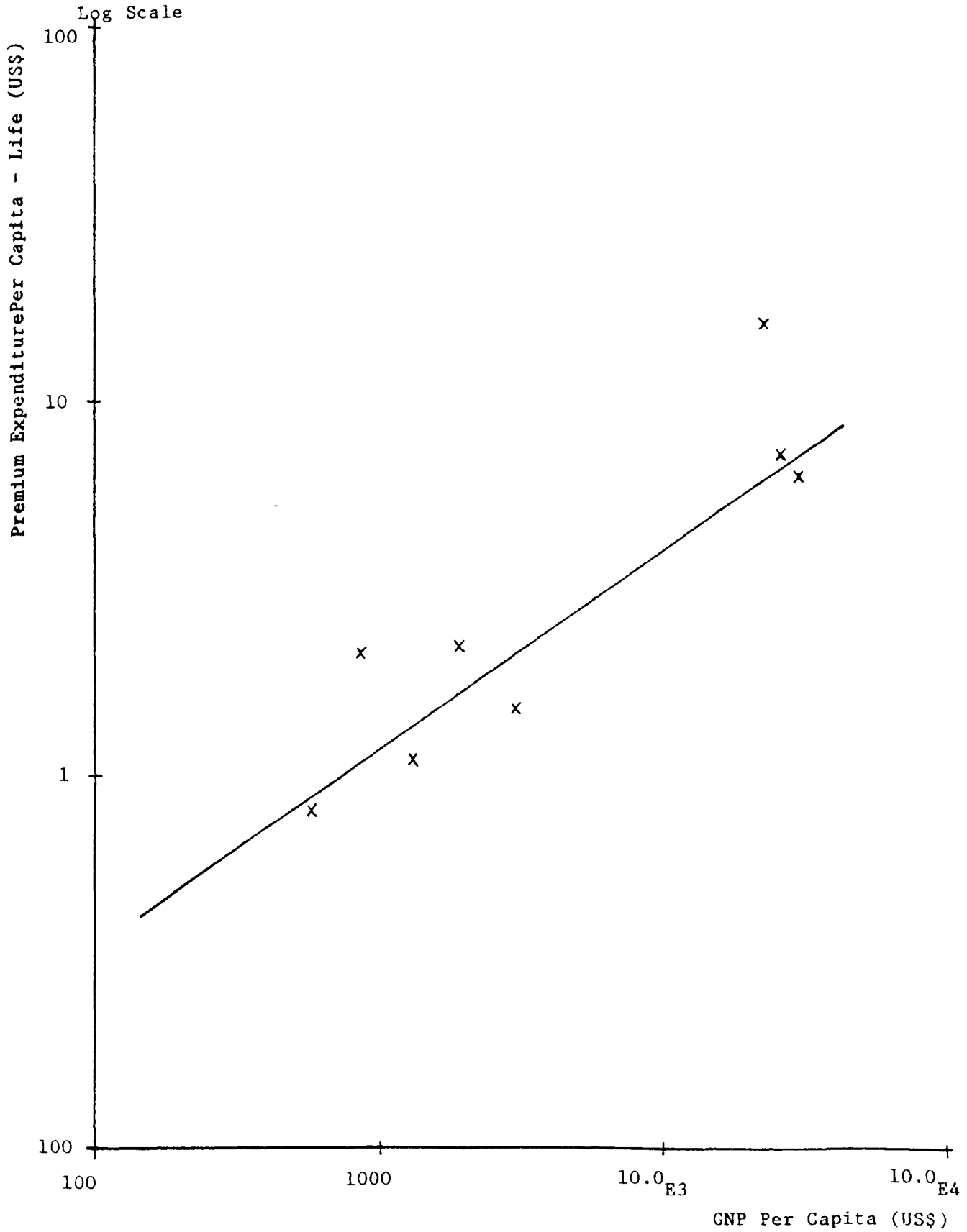


Figure 3.7

Life Premium Income Per Capita and GNP Per Capita (1980)
8 Arab Countries



Similar plotting has been produced separately for the data relating to the size of Arab countries. One marked disadvantage of logarithmic plotting, however, is that it reduces the differential between the developed and developing countries as far as the relationship between premium expenditure per capita and the GNP per capita is concerned.

The regression lines drawn in the four scatter diagrams show the following relationship between premium income per capita and the GNP per capita.

Model $Y_i = a + b X_i + U_i$
where Y_i = Log 10 (premium income per capita)

X_i = Log 10 (GNP per capita)

This Model can be used in order to illustrate the relationship between X and Y. The results show that the t value for all countries as well as the Arab countries is highly significant at 1% level. Nevertheless, it is required to estimate the parameters a and b using the least square method. Using the data shown in table 3.16, we obtain

Variable	No.of countries	Non-life R^2	Non-life Coefficient	Non-life Std. Err.	Non-life T-value	Life R^2	Life Coefficient	Life Std. Err.	Life T-value
All Countries	51								
Constant		0.884	-2.986	0.243	-12.240	0.583	-3.632	0.586	-6.195
GNP-Log			1.317	0.068	19.364		1.354	0.163	8.283
Arab Countries	8								
Constant		0.929	-1.756	0.376	-4.664	0.814	-1.621	0.411	-3.944
GNP-Log			0.911	0.102	8.866		0.576	0.112	5.138

The regression equation expresses the relationship between premium income per capita and GNP per capita. The value of b in non-life

insurance, for instance, indicates that an increase of 1% in the GNP per capita will be accompanied by a 1.317% increase in the premium income per capita for all countries and smaller, i.e. 0.911% for Arab countries. Also for life insurance, the increase in the premium income per capita is much smaller than that of the all countries. There are some reasons contributing to the limited premium expenditure per capita in the eight Arab countries. These reasons are:

(i) the low level of knowledge and awareness of insurance and its benefits;

(ii) the limited degree of development of the various economic sectors;

(iii) the relatively new insurance markets; and

(iv) the religious attitude.

The economic significance of insurance in various countries is also illustrated by the ratio of premium/gross national product (GNP). Although part of the growth was attributed to inflation, as mentioned earlier, the premium volume in the Arab World increased from US $701.5 million in 1974 to US $2037.4 million in 1979. In the same period the GNP (World Bank-Atlas, 1976 and 1981) rose from US $86.610 billion to US $212.580 billion. However, the ratio premiums/GNP, having risen from 0.81 percent in 1974 to 1.03 percent in 1978, dropped slightly to 0.96 percent in 1979 (see table 3.17 and figure 3.8). This drop was attributed mainly to the fact that the ratio of premium/GNP in six oil producing countries was declining in 1979. This was largely due to the massive increase in their oil revenues which constitute most of their national income, and

Table 3.17

Premium as % of Gross National Product
(Market Prices) 1974-78

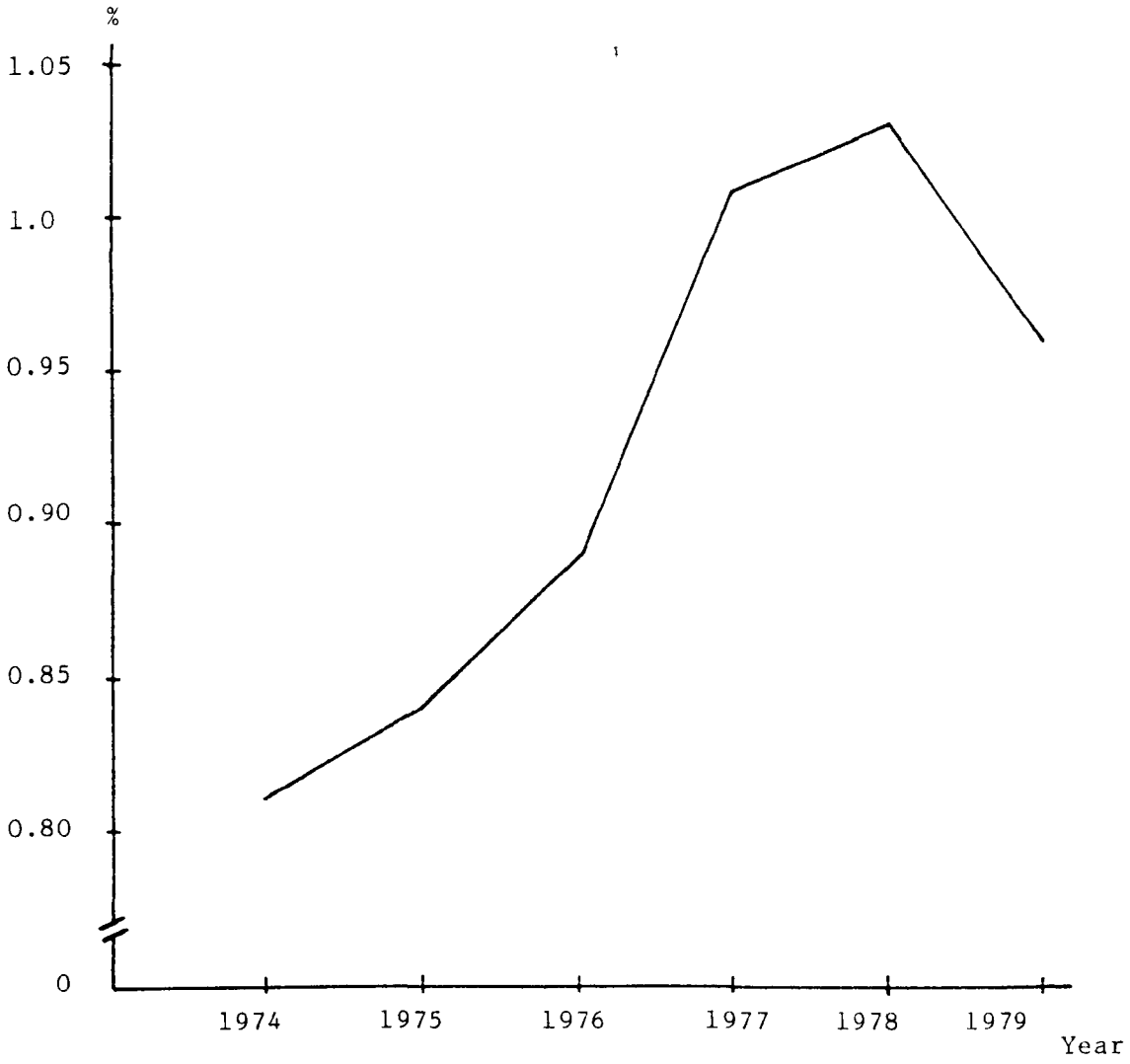
Country	1974	1975	1976	1977	1978	1979
Algeria	1.16	1.14	1.05	1.10	1.23	1.08
Bahrain	0.57	0.95	0.75	1.08	1.07	1.06
Egypt	0.96	1.30	1.37	0.70	0.79	0.86
Iraq	0.70	0.94	1.00	0.94	0.85	0.85
Jordan	0.82	0.99	1.08	1.52	1.50	1.61
Kuwait	0.57	0.45	0.66	1.10	1.06	0.85
Lebanon	0.99	-	-	-	-	-
Libya	0.72	0.66	0.61	0.69	0.69	0.65
Mauritania	-	0.71	0.92	0.73	0.95	1.04
Morocco	1.67	1.75	1.79	1.84	1.94	2.04
Oman	0.32	0.28	0.38	1.40	1.45	1.31
Qatar	0.51	0.42	0.48	1.86	1.68	1.05
Saudi Arabia	-	-	-	-	-	-
Somalia	1.34	1.15	1.33	1.53	1.70	-
Sudan	0.47	0.57	0.59	0.42	0.50	0.34
Syria	0.40	0.47	0.57	0.53	0.50	0.53
Tunisia	1.05	1.22	1.27	1.60	1.45	1.54
U.A.E.	0.21	0.27	0.33	0.87	0.96	0.68
Yemen (N)	0.04	0.14	0.23	0.26	0.29	0.49
Yemen (S)	0.75	0.54	0.70	3.22	3.01	-
	0.81	0.84	0.89	1.01	1.03	0.96

Sources: (1) Premiums - Table 3.7.

(2) GNP World Bank Atlas (1976-81).

Figure 3.8

The Ratio of Premium/GNP in the Arab World



Source: Table 3.17

also in 1979 the growth rate of the Arab's GNP was 38.3 per cent over 1978, compared with the premium income of 28.2 per cent.

Moreover, the ratio of premiums/GNP gradually increased in most Arab countries during the period 1974-79. In 1974 four countries showed a ratio of more than one percent, ten did so in 1977 as well as in 1978, and seven in 1979. An obvious feature of table 3.17 is that, in some countries the ratio of premiums/GNP has declined during a period of economic growth, so income elasticity has been less than 1. In short, the variable factors mentioned earlier provide a viable explanation of the lower ratio of premiums/GNP of these countries. However, in the case of oil producers, the sharp increases in oil incomes intervene as well.

Comparing the ratio of premiums/GNP on a world-wide basis shows that in North America the ratio rose by 10.5 percent between 1974 and 1979, compared with 11.9 percent for the EEC, 10.3 percent for the rest of O.E.C.D, 23.1 percent for the rest of the world and 25.0 percent for the Arab world, as shown in table 3 .18. Another insight into the relationship between premium volume and GNP for three decades is provided by tables 3.19 and 3.20, and figure 3.9. The highest ratio of premiums/GNP during the period 1950-80 was registered by North America, because of its very high economic development and because the insurance industry is highly developed. The increase was from 5.16 percent in 1950 to 7.0 per centin 1980, with an average annual growth rate of 1.0 per cent. In the EEC where the increase was from 2.67 per cent to 4.50 per cent the annual growth rate was greater than in North America i.e. 1.8 per centduring the same period. The growth rate in the non-O.E.C.D. countries was faster than of the O.E.C.D and registered 2.8 per cent although it followed the same broad cycle.

Table 3.18

Premiums as a percentage of Gross National Product 1974-79

Country Group	1974 Non-life	1974 Life	1974 Total	1979 Non-life	1979 Life	1979 Total	1979/1974 %
North America	4.2	2.5	6.7	5.0	2.4	7.4	10.5
EEC	2.6	1.6	4.2	2.9	1.8	4.7	11.9
Other OECD	1.9	2.0	3.9	2.0	2.3	4.3	10.3
Total OECD	3.0	2.0	5.0	3.3	2.1	5.4	8.0
Rest of the World	0.8	0.5	1.3	1.0	0.6	1.6	23.1
Arab World	0.7	0.1	0.8	0.9	0.1	1.0	25.0
Total World	2.8	1.8	4.6	2.9	1.9	4.8	4.3

* Excluding Communist countries.

Sources: Compiled as for Table 3.14.

Table 3.19

Premiums as a percentage of Gross National Product, 1950-80

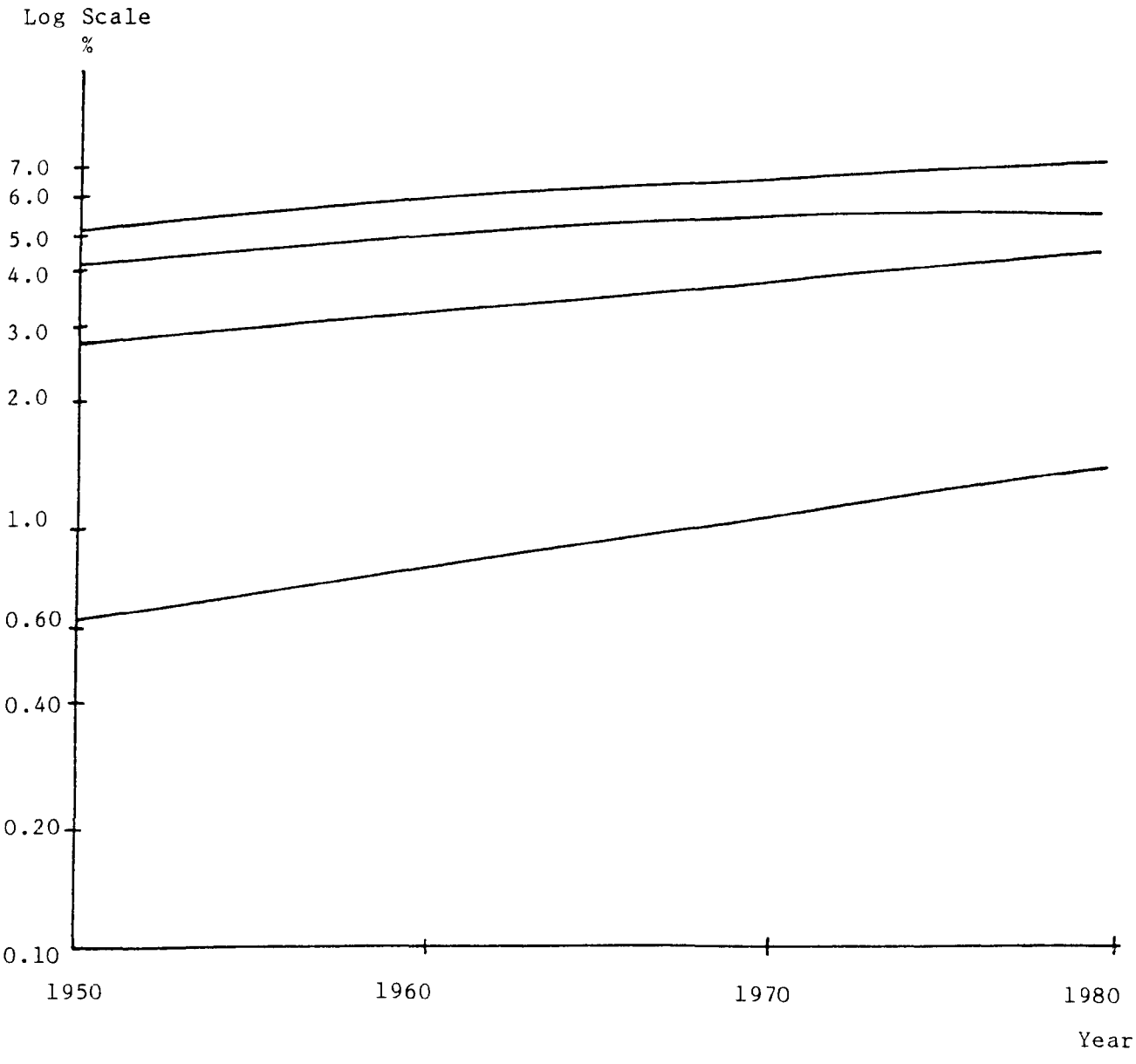
Country Group	1950	1960	1970	1980
North America	5.16	6.15	6.70	7.00
EEC	2.67	3.27	3.80	4.50
Other OECD	4.24	4.86	5.30	5.50
Rest of the World	0.61	0.83	1.10	1.40
Total World	3.61	4.24	4.70	4.80

*Excluding Communist countries.

Source: Sigma No. July/August 1981 and No. 2, 1982.

Figure 3.9

Premiums as a Percentage of GNP 1950-80



Source: Table 3.19

Table 3.20

Annual Rate of Change of Premiums

as % of GNP

Country Group	1950/1960	1960/1970	1970/1980	1950/1980
North America	1.8	0.9	0.4	1.0
EEC	2.0	1.5	1.7	1.8
Other OECD	1.4	0.9	0.4	0.9
Rest of the World	3.1	2.9	2.4	2.8
Total World	1.6	1.0	0.2	1.0

The above tables show very clearly that the growth of insurance business has been in excess of that of the world economy as a whole during the period 1950-80. Although income elasticity generally was greater than 1, as income rose the coefficient declined as shown by figures 3.4 - 3.7.

3.8 Main Features of the Arab Insurance Market and its Insurance Business Structure

The main features of the Arab insurance market will be summed up under five headings:

1. The low volume of premium income.

Despite the rapid growth of the Arab market premiums during the 1970s, the premium income of the Arab World nevertheless is still small compared with its relatively large area and population. The problem is more acute with life insurance, the demand for which remains slow due to:

(a) the low standard of living in most Arab countries,

(b) the cultural and religious influences,

(c) the lack of solid base of personal risks,

(d) the low investment returns on the life funds (as compared, say, with Europe or America), and

(e) the application of social security provisions in some countries.

Thus, it is clear that the majority of the Arab population still remain uninsured. For example in Egypt, out of the total population of about 41 million, at the end of 1979 there were only 689,049 individual life policies in force (i.e. 1.78 percent of the total population), with an average sum insured of E£568 (EGID, 1979, P.15). For the same year, in the U.A.E. there were 4381 individual policies (i.e. 0.63 percent of the total population) in force with an average sum insured of DH. 82,106 (Ministry of Planning, 1982, p.8).

2. The continued decline in the dominance of foreign insurers

Reference has been made to the policies pursued by some Arab States of establishing national insurance companies in order to reduce their dependence upon foreign insurance companies. The success of the three countries in reducing the market shares of foreign insurers, in respect of direct insurance business, is shown in table 3.21. It does not necessarily follow, however, that they have been equally successful in increasing the proportion of the domestic business retained by local companies.

Table 3.21

Percentage of premium Income Written by National and Foreign Companies in U.A.E., Jordan and Kuwait

Year	U.A.E. Market		Jordanian Market		Kuwaiti Market	
	National companies share	Foreign companies share	National companies share	Foreign companies share	National companies share	Foreign companies share
1974	37.5	62.5	55.0	45.0	-	-
1975	44.7	55.3	54.7	45.3	-	-
1976	53.7	46.3	62.0	38.0	-	-
1977	60.4	39.6	69.8	31.2	-	-
1978	60.8	39.2	69.5	31.5	75.0	25.0
1979	57.5	42.5	71.1	28.9	80.0	20.0

Sources: Extracted from:

(1) GAIF (1980), for Kuwaiti and Jordanian markets.

(2) Ministry of Economic and Commerce (1980) for the years 1974-78, and Ministry of Planning (1982) for the year 1979, (U.A.E. Market).

3. The composition of insurance portfolios

Two classes of insurance - motor and marine cargo - account for above a half of the total non-life premium income of most Arab countries (see table 3.22). Generally both classes are compulsory, though whereas in the Arab countries of North Africa motor liability insurance is required for both bodily injury and property damage, in most of the Middle Eastern countries only third party bodily injury cover is compulsory.

Motor insurance is the single most important class of non-life insurance in many countries, including the highly developed insurance markets of the major industrialised countries (see figure 3.10). The uncharacteristic feature of many Arab insurance markets is the importance of marine cargo insurance, which in some countries is the largest single class of business. Three factors may account for this phenomenon:

(i) regulations requiring all imports to be insured locally;

(ii) the increase in the volume of imports during the 1970s; and

(iii) the low levels of demand for other classes of insurance.

Table 3.22

The Share of Marine Cargo and Motor of the Total Non -life Premium Income in Some Arab countries

Country	Period	Percentage of premium income to total business	
		Marine cargo	Motor
Egypt	1975-79	33.0	27.6
Iraq	1971-80	47.6	16.0
Jordan	1975-79	32.9	42.7
Morocco	1969-79	6.8	44.2
Sudan	1969-77	45.8	n.a
Syria	1977-79	46.0	27.6
U.A.E.	1974-79	36.2	26.4
Yemen (S)	1977-79	56.0	8.1

Sources: For Jordan and U.A.E. as for Table 3.21.

Iraq: Annual Report of National Insurance Co.

Morocco: Annual Report of Societe Central de Reasurance.

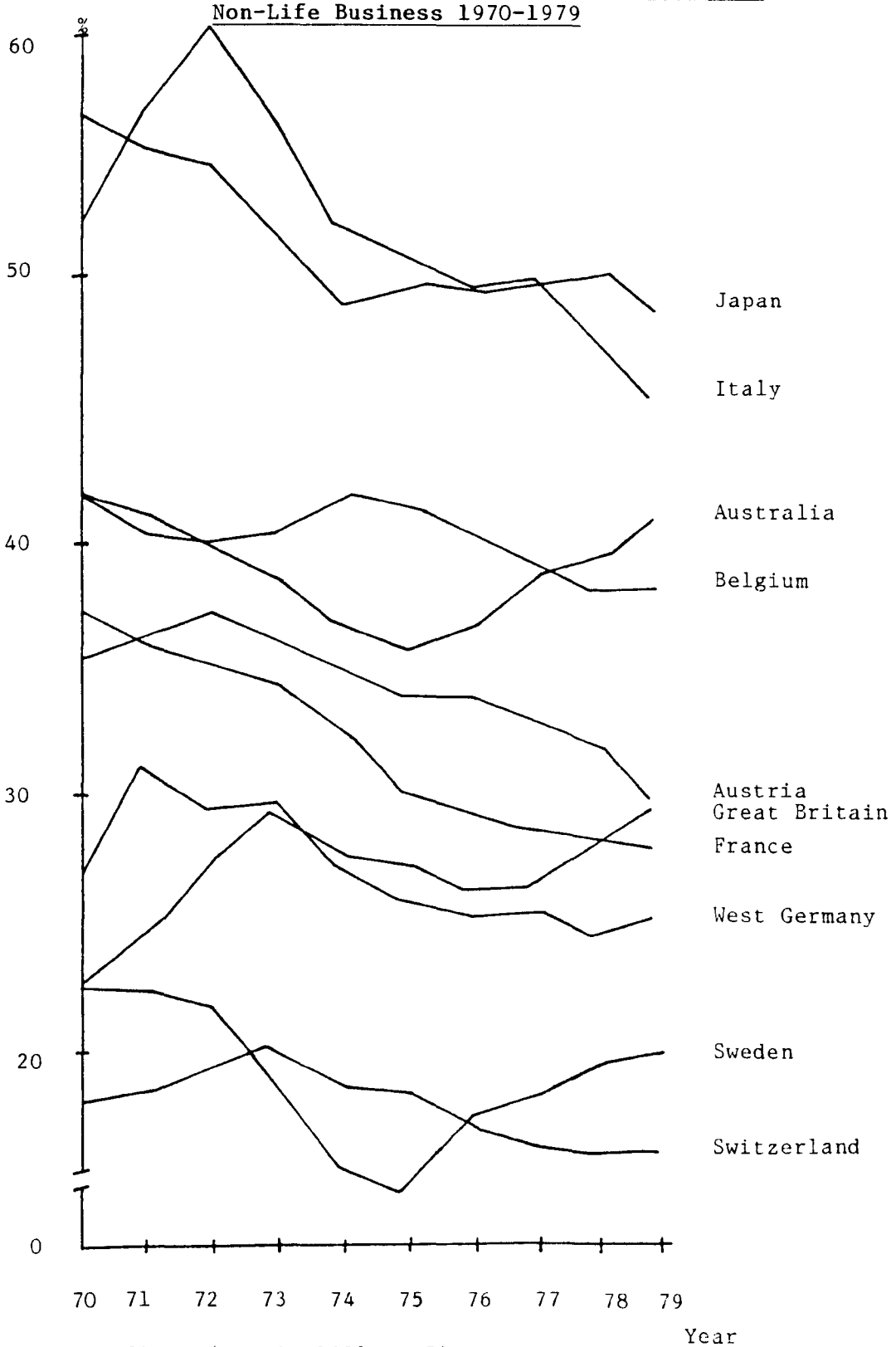
Egypt: E.G.I.O., 1976-79.

Syria and Yemen(S): GAIF (1980).

Sudan: Insurance Controllers, Office Records (1969-79).

Figure 3.10

Share of Motor Third Party Liability Premiums in Total Non-Life Business 1970-1979



Source: Sigma (No. 4, 1981, p.5).

4. The lack of balance between premium income and risk exposure

As shown in chapter two, rapid industrialisation in the Arab World has brought new projects associated with large risks. Individual risks have become very substantial in value today. In the last few years, insured values of hundreds of million U.S. dollars on a petrochemical plant or a conventional power plant have become usual in the Arab countries. The transport industry has moved to the adoption of large capacity vessels and aircraft. Every national fleet comprises a small number of very high value vessels or aircraft. Given the limited retention capacity available in the Arab insurance markets, a large proportion of the risks have to be placed in the international reinsurance market. The following problems illustrate the imbalance between loss potentials and the direct premium income of an Arab country in 1980.

Class of Insurance	Sum Insured	Total gross premium of the whole market portfolio for that class of insurance.
Fire-petrochemical plant.	U$400 million(EML)	U$ 43m.
Aviation - a 747 Boeing.	U$265 million (hull and liability)	U$ 7m.
Marine Hull - a vessel.	U$ 25 million	U$ 13m.

Although the insurance of marine hull risks has been arranged in joint slips by some Arab countries, the imbalance between loss potential and premium income is still unresolved, as shown below (figures for 1983):

Fleet	Number of vessels	Values per fleet	Average Value per vessel	Total premium for the fleet
A	25	U$835m	U$33.4m	U$3.25m
B	9	350m	38.9m	1.40m
C	10	350m	35.0m	1.50m
D	13	100m	7.7m	1.00m
E	15	350m	23.3m	1.70m
	72	U$1985m	U$27.6	U$8.85m

5. Generally favourable claims results.

Generally, the claims experience of Arab insurance markets bear a fair comparison with those of the developed countries. As can be seen from table 3.23, results vary considerably between classes. Compulsory motor liability insurance tends to be particularly bad, not least because of government restrictions on rate increases. Also claims ratios tend to display larger fluctuations than in the case of the developed markets, particularly in the small, badly unbalanced marine hull and aviation accounts.

Six of the Arab countries included in table 3.23 (viz, the U.A.E., Jordan, South and North Yemen, Tunisia and Libya) have experienced lower average claims ratios than the developed countries in almost all classes. Iraq has lower average ratios for fire and other motor business; Egypt's claims ratios are lower for fire, accident, marine cargo and aviation.

Table 3.23

International Comparisons of Claims Ratios

Class of Insurance	Developed countries 1976-80 Mean ratio	Developed countries 1976-80 Standard deviation	Iraqi direct business 1971-77 Mean ratio	Iraqi direct business 1971-77 Standard deviation	Egyptian direct business 1974-79 Mean ratio	Egyptian direct business 1974-79 Standard deviation	U.A.E. direct business 1974-79 Mean ratio	U.A.E. direct business 1974-79 Standard deviation	Jordanian direct business 1975-79 Mean ratio	Jordanian direct business 1975-79 Standard deviation	Moroccan direct business 1974-78 Mean ratio	Moroccan direct business 1974-78 Standard deviation	Yemen(S) direct business 1977-79 Mean ratio	Yemen(S) direct business 1977-79 Standard deviation	Yemen(N) direct business 1977-80 Mean ratio	Yemen(N) direct business 1977-80 Standard deviation	Tunisian direct business 1975-79 Mean ratio	Tunisian direct business 1975-79 Standard deviation	Libyan direct business 1974-78 Mean ratio	Libyan direct business 1974-78 Standard deviation
Fire	(12) 57.2	12.7	40.3	21.7	42.7	22.1	66.6	43.1	55.0	45.0	35.4	11.4	13.2	13.9	19.8	14.3	60.8	10.0		
Burglary	(8) 71.8	25.4																	30.2	11.1
Accident	(10) 59.8	17.8	87.4	25.1	45.3	23.5	49.2	18.9	34.1	4.6	31.8	6.9	64.1	110.9	34.8	6.0	51.0	20.2	51.2	49.6
Liability	(10) 63.7	12.7									68.4	27.9								
Motor - liability	(13) 81.2	17.9	123.5	44.3	215.6	53.4														
Motor - other	(9) 70.7	13.5	58.8	33.7	67.3	9.7	70.2	13.0	55.8	6.2	87.6	11.5	7.7	3.6	54.1	6.4	57.0	4.9	44.7	17.7
Inland transport					34.2	3.9														
Marine cargo			78.1	29.7	78.2	9.0	88.4	27.7			49.0	2.2	16.8	17.4	75.9	75.1				
Marine hull	(11) 76.0	13.3	87.9	24.1	125.1	146.2	43.4	66.2	73.9	21.1	159.9	252.2	14.5	22.8			62.1	29.6	44.7	8.6
Aviation			106.3	64.2	235.0	237.7	37.1	33.4			17.6	13.1	3.8	3.5	25.3	26.2				

Sources: (1) Arab countries - as for table 3.22

(2) Developed countries - Swiss Re (Sigma, No. 9, 1982).

(3) Loss ratios about the Moroccan market, South and North Yemen, Tunisia and Libya derived from Faris (1983) country pages.

3.9 Future Development of Arab Insurance Business

Although the fall in oil prices in 1982 has caused some cutbacks in economic development plans, the demand for insurance in the Arab World should continue to grow at a relatively fast rate. Oil reserves are sufficient to provide continuing export earnings that can be used to finance economic development plans for several more decades.(1) Therefore, Arab insurers and reinsurers can expect their premium incomes to continue to grow.

All classes of insurance should benefit from the continuing economic growth discussed in chapter two. Fire premiums should increase with the construction of new industrial, commercial, housing and other social projects and the trend towards higher insured values. The further expansion of Arab trade should also lead to a considerable increase in premium volume in marine insurance.

The growing need for transport as a result of the expanding economy and increasing passenger traffic, and the demand for very large airports and jumbo jets will have an effect on the development of aviation insurance in the near future. A further expansion of Arab air traffic should be expected in the coming years. As far as the future prospect for engineering insurance is concerned, it seems probable that the scale of investment in construction in the Arab World will continue to decline. This means that a lower growth rate in premium income will be expected.

The accelerated revenue growth of many Arab countries has resulted in a rise in the income of their people and led to an expan-

(1) Ironically, the War between Iran and Iraq gave an added boost to developments in the Arab World.

ding demand for cars, a trend which can be expected to continue for many years to come (see table 3.24). Likewise, rising real incomes should increase the present very low demand for other classes of personal inusrance. However, despite the fact that the number of motor vehicles in the Arab countries has grown rapidly during the period 1970-78, the Arab market is still very small. In 1970, out of 21 Arab countries, 12, with a population of 78.59 million, had 1,073,983 vehicles;i.e.14 vehicles for every thousand persons; by 1978 that number had grown to 28. Hence, compared with the developed nations, there is still a very low development rate in motor vehicle traffic in the Arab World.(1)

Although satisfactory insurance developments have been achieved in recent years, there is still much to be done in order to increase the volume of insurance business in the Arab World. There are several specific areas of importance:

(i) It is regrettable that the agricultural sector is still a long way from providing adequate insurance coverage. Some Arab countries have no crop insurance programmes in operation. Others, where the agricultural sector is of great importance to their economies, have limited and insufficient crop insurance programmes. Therefore the insurance companies together with the government need to pay greater attention to the development of crop insurance. UNCTAD (1980, pp.7-10) suggests a number of conditions must exist, which would thereby increase the likelihood of successful crop insurance. These conditions are:

(1) In 1980 the United States, with a population of 227.7 million, had 151.9 million motor vehicles, i.e. one vehicle for every 1.5 person. The United Kingdom, with a population of 56 million, had 19.2 million licensed motor vehicles, that is one for every 2.9 persons.

Table 3.24

Motor Vehicles in Use and Vehicles per Capita in the Arab World (1970-78)

Country	1971		1972		1973		1974		1975		1976		1977		1978		Annual av. growth rate of motor in use
	Motor vehicles in use	Vehicles per capita	Motor vehicles in use	Vehicles per capita	Motor vehicles in use	Vehicles per capita	Motor vehicles in use	Vehicles per capita	Motor vehicles in use	Vehicles per capita	Motor vehicles in use	Vehicles per capita	Motor vehicles in use	Vehicles per capita	Motor vehicles in use	Vehicles per capita	
Algeria	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a
Bahrain	13400 N	0.06	n.a	n.a	22000	0.09	26800	0.11	32700	0.13	41000	0.15	48700	0.18	54700	0.20	16.9
Dujibouti	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a
Egypt	189000	0.0055	206000	0.0059	215000	0.0060	225000	0.0062	262000	0.0071	303000	0.0080	347000	0.0089	415000	0.010	11.9
Iraq	116427	0.012	138443	0.014	143655	0.014	152966	0.014	205369	0.018	200100	0.017	224930	0.019	256165	0.021	11.9
Jordan	23101	0.010	24007	0.010	25259	0.010	32873	0.013	42721	0.016	54710	0.019	74186	0.026	90263	0.030	21.5
Kuwait	158446	0.20	175526	0.21	197777	0.22	223788	0.23	272232	0.27	320656	0.30	379101	0.33	429543	0.35	15.3
Lebanon	163739	0.064	184187	0.071	207344	0.078	243584	0.089	261679	0.094	261685	0.095	287665	0.11	313499	0.12	9.7
Libya	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a
Mauritania	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a
Morocco	311400 N	0.020	n.a	n.a	387700	0.024	414400	0.025	447300	0.026	492100	0.028	538600	0.029	573300	0.030	9.1
Oman	5516	0.008	9771	0.014	12860	0.018	19225	0.026	29359	0.038	40949	0.052	54085	0.067	66498	0.079	42.7
Qatar	n.a	n.a	n.a	n.a	n.a	n.a	6395	0.040	10273	0.060	13426	0.070	14755	0.074	10906	0.052	14.3
S. Arabia	19234	0.003	31134	0.005	62759	0.009	112048	0.016	159339	0.022	260082	0.034	338530	0.043	319936	0.039	49.4
Somalia	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a
Sudan	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a
Syria	43206	0.007	44852	0.007	50514	0.007	53175	0.007	73620	0.010	91329	0.012	107435	0.013	98188	0.012	12.4
Tunisia	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a
U.A.E.	12793	0.046	16822	0.049	23923	0.057	30955	0.069	43960	0.086	62276	0.11	105716	0.17	135197	0.21	40.1
Yemen (N)	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a
Yemen (S)	16821	0.1	16842	0.01	17729	0.01	17985	0.01	20398	0.012	21056	0.012	22157	0.012	24515	0.013	5.5
	1073083	0.014	847584	0.013	1367521	0.016	1559194	0.018	1860950	0.021	2162369	0.023	2542860	0.027	2787710	0.028	14.6

Source: (1) United Nations (1982), country pages.
(2) United Nations (1983), for Bahrain and Morocco.
(3) Population. Table 2.1A Chapter two.

N: Figures for 1970.

Note: (1) Motor vehicles in use: Passenger ' cars plus trucks plus buses.
(2) Motor vehicles in use in the U.A.E. are only for Abu Dhabi and Al-Ain.

(a) farmers should understand and appreciate a crop insurance programme.

(b) farm sizes should not be extremely small and widely scattered.

(c) personnel involved in crop insurance programmes should have considerable knowledge of the complexities involved in efficient farming and insuring.

(d) a crop insurance programme should be based on sufficient statistical data regarding crop losses experienced in the past.

(e) a crop insurance programme should be supported by complementary agricultural programmes, such as using efficient farming techniques to increase farm production, fixing a system of appropriate transportation, storage, and processing facilities.

(ii) It was demonstrated earlier that motor third party insurance in some Arab countries does bring in a high share of the premium. This does not mean, however, that motor premium income is well developed. In many Arab countries the premium income is still relatively small. This is due to the still low level of motorisation in many of the countries. (see table 3.24). In the meantime the absence of motor liability legislation, in Saudi Arabia and Lebanon for instance, has led to a considerable decrease in motor premium income. In Saudi Arabia for example, there are only 30 percent to 40 percent of vehicles insured. Efforts are needed to find new sales channels to reach the hitherto uninsured 60 percent to 70

percent.

(iii) A possible increase in the size of premium income for life insurance may depend on:

(1) the popularisation of life insurance through insurance education and adequate marketing methods;

(2) tackling the effect of inflation on life business;

(3) As the prices of life insurance in most Arab countries are high, it is advisable for individual companies to review their prices and make them more attractive from the consumer's point of view. The argument against high prices in life insurance can be clearly seen in the following example on the Egyptian market. El-Mansoury (1978, p.25) has pointed out that in industrial life insurance the price for a term policy to a person aged 30 years, for a period of 10 years, with a sum insured of £1,000, is about £12.6 in an Egyptian company, whilst in a U.K. company it would be £1.75. Similar examples may be found in other types of life insurance.(1)

(iv) There are still several classes of insurance such as, credit insurance, bonding insurance, Fidelity insurance, Medical Malpractice insurance and many others, which are undeveloped or unknown in many Arab insurance markets. The expansion of these classes of insurance is highly dependent on the efforts of insurance companies.

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(1) Despite the absence of data, the life expectancy in Egypt is much lower than in the U.K., so the higher premium.

3.10 Conclusions

Insurance in the modern sense was introduced to the Arab World by European insurance companies. These companies have dominated the Arab insurance markets for a long time. Gradually, since the 1960s, the number of national companies has increased and with a consequent decrease (except Saudi Arabia and U.A.E.) in the number of foreign companies. The rapid development of the Arab economies has resulted in a high demand for insurance, and premium income nearly tripled during the period 1974-79. The rate of premium growth during the 1970s ranks foremost amongst many of the developing and developed countries. The fastest growth in many Arab insurance markets is seen in the two classes, e.g. marine cargo and motor insurance, where insurance is compulsory.

Life insurance continues to be the least developed of all classes, and different factors continue to be the deterrent to the growth and spread of this class. There is a need for the insurance companies in the Arab World to educate consumers about the value of life insurance. Once this is achieved, life premium income will grow considerably.

Given the substantial premium income growth that has occurred in the Arab World, the expenditure per capita on insurance also has grown very fast. However, premium expenditure per capita in the Arab region still remains relatively small compared with the developed countries.

Furthermore, with the exclusion of motor insurance business, the underwriting results of insurance business in the region have generally been profitable during the 1970s.

It may be concluded that the future for the insurance industry in the Arab World looks bright.

CHAPTER FOUR

REVIEW OF INSURANCE AND REINSURANCE LEGISLATION AND SUPERVISION IN THE ARAB WORLD

4.1 Introduction

The governments of many Arab countries exercise considerable direct control of their economies. Often the state is either the only or the main sponsor of major new investment projects, and besides operating the normal public services, state owned corporations control large sections of industry and commerce too. Insurance is no exception. In some countries insurance and reinsurance institutions have either been formed by their respective governments, or certain forms of help were made available to them. Even in the countries where insurance is still privately owned the state often exerts considerable influence on both the structure of the insurance market and on the way insurance is practised.

In general, both the operations of insurance companies and of contracts of insurance are subject to supervision. Besides being governed by the ordinary law of contract, insurance contracts are also subject in every Arab country to specific provisions. In some countries those provisions are contained in a special law (e.g. Lebanon), whereas in other countries insurance contracts are covered by separate chapters in the civil or commercial code, or other codes of law (e.g. Iraq).

The purpose of this chapter is to examine insurance legisla-

tion and supervision in the Arab World and to provide a framework for the consideration of the present regulations and their effect on the development of the Arab insurance industry.

4.2 The Objective of the Insurance Legislation and Supervision.

Most governments in formulating insurance legislation often to some degree have conflicting objectives, notably:

- the protection of policyholders;
- the development of the national economy including the building up of locally-owned insurance industries in order to reduce their dependence on foreign insurers.(1)

A good example of the conflict between these objectives is in the field of solvency margin regulation. The absence in most Arab countries of specific provisions for determining minimum solvency margins directly clashes with the objective of protecting policyholders and third party claimants against loss due to an insolvency. The problem is more acute if one compares the local absence of solvency margins with the imposition of such margins on international insurers by the supervisory laws of their own countries.

Another example is the exclusion of large international insurers, that both enjoy economies of scale and possess the skill to discriminate fairly in the rating of their policyholders' risks, in favour of local insurers that may not possess such advantages.

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(1) In Europe, insurance supervision has one common aim: "to safeguard proposers, policyholders and beneficiaries and any other third party interested in the due performance of the contract. Their essential function is to see that insurance concerns conduct their business properly and remain solvent, and, in most countries, that the contracts conform to the law. Certain countries carry the principle of protecting the insured still further, particularly as regards the supervision of premium rates and the limiting of profits of insurance concerns " (OECD, 1963, p.10).

4.3 State Legislation and Insurance

In Europe and the U.S.A, insurance supervision in its normal sense dates from the late 19th/early 20th centuries. For example, regulations for life insurance were enacted in Norway in 1911 and the United Kingdom in 1870.

Insurance statutes in Arab countries may differ in their formulation, but they are derived from two main sources:

(a) The United Kingdom legislation and tradition;

(b) Legislation of other Western European countries, especially France.

The adoption by Arab countries of one or the other of these systems is usually the consequence of their colonial past. For instance, in Morocco and Tunisia insurance control and legislation in many ways reflects the French influence, whereas in Egypt and Jordan the laws follow those of the United Kingdom.

State intervention in insurance may take many forms; for example:

- the state may participate by becoming a shareholder in some existing insurance companies (e.g. Kuwait, Morocco, Sudan), or
- it may advance part of the capital in new mixed enterprises and support them by special securities (e.g. Kuwait), or
- the state may eliminate all foreign insurance enterprises operating in the local market, requiring them either to wind up their businesses or to sell their shares in the domestic market (e.g. Algeria, Iraq, Libya); or
- the state may merely enact regulations aimed at improving

insurance security (e.g. Jordan, Lebanon).

The present degree of intervention and supervision came about by stages. For example:

(a) in some countries supervision goes back 50 years (e.g. Egypt and Iraq) whereas in others it is fairly recent (e.g. Jordan and Oman);

(b) in a number of cases the insurance regulation process has been over-taken by nationalisation;

(c) attitudes to the participation of foreign insurers vary considerably;

(d) in a few countries, notably Bahrain, Saudi Arabia and United Arab Emirates, there are currently no regulatory authorities or supervision of insurers or insurance intermediaries, a fact which is beginning to cause concern in relation to the insurance industry and the public interest. In these countries, commercial company law is the only regulation applicable to insurance and reinsurance companies.

In conclusion, we are dealing with countries with widely differing political regimes and attitudes towards insurance. There exist:

(i) those countries which still have some degree of free enterprise competition; and

(ii) the socialist countries with nationalised markets.

However, the discussion contained in this chapter (viz, on the supervision of insurance) obviously does not apply to those Arab countries where there is no such supervision.

4.3.1 Regulations Applicable only to Competitive Markets

4.3.1.1 Commencing Insurance Business

In those countries with competitive markets (as listed in table 4.1), companies are required to obtain prior authorization by the state to commence insurance business. This authorization takes the form of an administrative act which is issued either directly by the Minister responsible or the responsible authority, usually the insurance supervisory service.

Table 4.1

Prior Authorization by the State to Commence Business

Not applicable		Applicable
Nationalised Markets	Markets with no supervisory laws	Competitive Markets
Algeria Iraq Libya Mauritania Somalia Syria South Yemen	Bahrain Saudi Arabia U.A.E.	Egypt Sudan Jordan Kuwait Lebanon Morocco Oman Qatar Tunisia North Yemen Dujibouti

Detailed below are some examples of the various conditions that must be met in different countries by insurance companies seeking authorisation:

(a) In Jordan, no company may be granted a licence to engage in

insurance unless it has completed the registration formalities in accordance with the law. Also, before commencing business, it must furnish a deposit in the form of money or its equivalent in shares and bonds amounting to JD 20,000 if the company deals in life insurance, or JD 10,000 in respect of other classes of insurance. A foreign insurance company which applied to open a branch in the Kingdom must submit several kinds of documents, e.g. proposal forms, general policy conditions etc. According to the entry in "Insurance in the World's Economies" (1982, p.405),since 1975 Jordan has stopped licensing new foreign insurers. Nor has there been, since 1981, new licensing of domestic companies, in order to prevent the fragmentation of this small market.

(b) Licensing of insurers, insurance agents, actuaries and assessors is required in Kuwait. All registration formalities, including those required by company law, must be completed before a licence is given. A licence must be renewed annually for each class of business accepted. Only Kuwaiti nationals can be licensed as agents: likewise nowadays an insurance company must be owned by Kuwaitis (Financial Times, 1979, pp.19-20). Like Jordan, Kuwait discriminates against foreign insurers, no new licences have been granted to foreign insurers since 1961.

(c) In Lebanon, each insurer and intermediary must be constituted as a corporation, and comply with minimum capital and reserve requirements, before a licence is granted.

(d) Morocco and Tunisia have used the licensing regulations to

reduce the numbers of companies operating in their markets. Both countries have introduced regulations requiring licensed insurers to conduct a minimum volume of business. Morocco first introduced such legislation in 1965 with the following results:

Year	Minimum net (of reinsurances ceded) premium income	Number of companies	
		Before	After
1965	1 million dirhams (U$254,000)[1] operative from 1968	130	54
1968	4 million dirhams (operative from 1971)	54	30

By 1977 only 19 companies, all of them at least 50 per cent Moroccan owned, were still operating. In Tunisia the law of 31st December 1974 required companies to maintain a minimum net premium income of TD 500,000 (U$ 1,145,475)[2] or lose their licence.

(e) In Qatar, despite the fact that foreign insurers are allowed to operate in the country, no new licences are now being issued to foreign insurers. (Wood, 1983).

It is common to specify in the licence the class(es) of business the company is authorised to write. If the company decides in the course of its business to engage in some other class of insurance it must make the appropriate application to the competent authority. This is important in countries where financial guarantees are required for each class of business transacted.

The authorization to carry on insurance business may be, and generally is, withdrawn when the legal requirements and the condi-

(1) U$ converted at 3.9367 dirhams.
(2) TD 0.4365 was equivalent to one US$ in 1974.

tions on which the authorization was granted are no longer fulfilled. In Jordan and Kuwait, for example, the licence is withdrawn if there is a loss of one-half of the company's paid-up capital. In Lebanon the licence is withdrawn if the enterprise has not commenced business during the period for which the licence was granted. Determining whether or not a company's financial base is unsatisfactory is left to the supervising authorities.

Lastly, in the case of Morocco and Tunisia the licence may be withdrawn if the company's volume of business falls below the specified minimum. The practical effect of the authorities' efforts to eliminate marginal companies has been the disappearance in recent years of a large number of small companies.

4.3.1.2 The Legal Conditions

In order to set themselves up in business, insurers are as a rule, required by the authorities to assume a particular legal form; usually the forms recognised are the joint stock company with limited liability, and the co-operative or mutual company. Legislation to this effect has been enacted in Tunisia. In Lebanon mutual companies may conduct only life, sickness and personal accident insurance business. In Morocco, although there are no special requirements in this regard, all the national companies are of the joint or mutual type. In Egypt, Jordan and Oman national companies must be stock companies. In no country are individuals or partnerships allowed to underwrite insurance business, though in Jordan

and Lebanon business can be placed with Lloyd's of London.

Basically, insurance law is supposed to regulate two broad fields; the functioning of insurance companies, and the contractual relationship between insurance companies and policy-holders. The obligation to submit to the supervisory authority those documents which form the basis of the contractual relationship with policy-holders, exists in most Arab countries. In addition, many countries have laid down rules which apply to contracts for specific classes of insurance, generally compulsory forms of insurance, such as motor vehicle and workmen's compensation(e.g. Jordan and Kuwait).

Reinsurance operations in the majority of Arab countries are usually carried on under much less stringent legal restriction, even though reinsurance is universally accepted as an essential factor for the financial stability of local insurance. Regulations aim mainly to ensure that technical and financial principles are observed, and the requirements of the law usually do not go beyond the stipulation that copies of treaties and other contractual documents shall be submitted by ceding companies to the relevant authority.

4.3.1.3 The Financial Conditions

As one of the essential purposes of insurance legislation and supervision is to ensure that companies are always able to fulfil their commitments, the laws define the financial guarantees that must be offered by these companies. Insurance companies are usually required to have a minimum share capital, the requirements for which

vary from country to country, and change with the course of time. The amount may also vary according to the class of insurance undertaken, the highest amount being required as a rule in life insurance. In most countries, the supervisory authority's requirements in this regard are specified by law. For example:

(a) In Lebanon, insurers are required to have minimum capital of LL 1 million (except for Lloyd's, which has special provisions.

(b) In Egypt, companies owned by Egyptian persons or corporations are required to have a minimum share capital of LE2 million, half of which must be paid-up. Similar requirements apply to companies operating in the Free Zone.

(c) In Morocco, an advisory committee exists which may recommend a minimum share capital relating to individual cases. This is consistent with the government policy of enhancing local retention by encouraging the formation of large units.

(d) In Tunisia, the minimum share capital is 1 million Tunisian dinars.

(e) In Oman, local companies should have a minimum share capital of OR 300,000.

Share capital requirements often differ between foreign and domestic companies; Kuwaiti companies, for example, must be entirely Kuwaiti owned and have paid-up capital of KD 150,000, whilst foreign insurers must have a paid-up capital equivalent of KD 225,000. The paid-up capital of a Jordanian insurance company may not be less than JD 100,000, whilst that of a foreign company may not be less than the equivalent of JD 250,000, (Financial Times, 1977,

pp.419-20). Recently Jordan announced a proposed new law which would require an increase in paid-up capital to JD 1.5 million for all companies operating in the market. The government's main objective is to reduce the number of smaller companies (ReActions, 1982, p.11). In U.A.E. a minimum paid-up capital is required of Dh 1 million for local companies, Dh 2 million for companies from other Arab countries and Dh 3 million for foreign companies (Wood, 1983).

In addition, companies in some Arab countries are also required to effect deposits in respect of life and non-life business as shown below:

	Deposits required	
Country	Life	Each class of non-life
Egypt	E£ 25,000	E£ 25,000
Jordan	JD200,000	JD150,000
Kuwait	KD 45,000	KD 30,000
Lebanon	LL100,000	LL100,000
Oman	OR150,000	OR 75,000

Source: (1) (Wood, 1983) for Egypt, Kuwait, Lebanon and Oman.

(2) (Crowe, 1982, p.406) for Jordan.

Note: Deposits for foreign insurers must be twice the amounts required of Omani companies.

Arab countries are not alone in discriminating betwen local and foreign companies. Supervisory regulations in many developed and, especially, developing countries, so discriminate in regard to financial requirements. However, a larger share capital per se provides no guarantee that a foreign insurer will be able to fulfil its obligations to local policyholders. Far more satisfactory are solvency regulations equally binding on all companies, plus, possibly in the case of foreign insurers, a requirement that they

maintain adequate funds locally to cover their liabilities to local policyholders.

Nevertheless, insurance control in the competitive Arab insurance markets varies from country to country. For example, to protect policyholders' rights against unfair treatment, companies in Egypt and Tunisia must submit their contracts, premium rates, and tariffs for approval. In Kuwait the general conditions of insurance contracts are not controlled, but copies of policy forms have to be submitted to the Insurance Controller, (Crowe, 1982).

4.3.2 Regulations Applicable to Both Competitive and Nationalised Markets.

4.3.2.1 Reserving Regulations

Generally insurers receive premiums at the inception of the period of insurance, but do not discharge their liability under most of their insurance contracts during the accounting year in which the premium is received. They must, therefore, make provision in their accounts for possible future payments. This provision is made by what are known as technical reserves. In life insurance, such reserves are based on actuarial valuations, employing assumed mortality rates and future interest rates, of the present values of prospective claims less prospective premiums in respect of policies in force. In non-life insurance at least three forms of reserves are necessary: (i) the outstanding claims reserves; (ii) the incurred but not reported (IBNR) claims reserves; and (iii)

the unearned premiums reserves.

Any soundly managed insurance or reinsurance company must in the process of carrying on insurance, establish reserves equivalent to the most accurate estimate possible of the funds which the company must possess at any time in order to be able to pay both outstanding (including IBNR) claims, and claims (capital sums, annuities, indemnity) which may arise under its policies by maturity or other stipulated contingency. In motor third party liability, workmen's compensation, and liability insurance, loss reserves are important as the actual results may not be known for five or more years. If the reserves cannot be estimated accurately, then a larger fluctuation of underwriting results will be produced, and vice versa.

In some Arab countries the reserve for unearned premiums must be calculated as a fixed percentage of the premiums written in the course of the year. The proportion tends to range from 15 to 50 per cent as shown below:

Country	Marine business	Non-Marine business
Egypt	25%	47% for motor T.P.L. 40% for other non-marine
Jordan	30%	40%
Kuwait	15%	30% (Both on gross premiums)
Lebanon	25%	40%
Oman	n.a	45%

Source: (1) (Crowe, 1982) for Jordan, Kuwait, Lebanon and Oman.
(2) (UNCTAD, 1982, p.18) for Egypt.

Usually insurance laws expressly require the establishment of reserves for losses which have occurred but have not yet been settled by the date of the balance sheet. Such laws in most Arab

countries seldom specify the method to be employed for their calculation. Therefore both insurance and reinsurance companies generally are free to calculate their outstanding claims reserves according to either actuarial principles or other rules, although a fixed minimum is sometimes prescribed. The one exception is the Arab countries in North Africa (whose insurance laws are based on that of France) which require insurance companies to calculate their outstanding claims on a 'file-by-file' basis (UNCTAD, 1972, p.53).

In none of the Arab countries do the insurance regulations specify the method of calculation of IBNR reserves. It can only be assumed that supervisory authorities take an empirical view in the light of the experience of insurance companies operating in the local market.

Reinsurance adds a new element to technical reserves. Insurance companies can transfer part of their liability to reinsurers against payment of a reinsurance premium, but they still remain fully liable vis-a-vis the insured and other third parties. Insurance companies are allowed to deduct from their technical reserves the part chargeable to their reinsurers; when such deductions are made the residuals are known as 'net reserves'. The difference between the gross reserve system and the net reserve system is important, particularly where the law provides that a sum equivalent to the technical reserves must be invested locally.

4.3.2.2 Investment Regulations

The regulations discussed above regarding the calculation

of technical reserves and, in some cases, solvency margins, are one aspect of the security for policyholders. Some countries go further in specifying the forms of securities in which the assets covering those liabilities must be invested. For example, Kuwait requires 40 per cent of the reserves to be in cash deposited in Kuwaiti banks, not more than 25 per cent in foreign stocks, not more than 30 percent in Kuwaiti companies, and the balance in local property development. In Morocco, at least 50 per cent of the underwriting reserve must be invested in securities or other documents of title guaranteed by the Moroccan government, and the remainder may be invested in real estate (or mortgages, mortgage bonds and the like) or securities quoted on the Casablanca stock exchange.

Insurance regulations in Arab countries very seldom permit the investment of funds abroad. The few known exceptions are Kuwait, as noted above, and Lebanon, which allows insurance companies to purchase foreign shares and bonds approved by the Minister for the National Economy, to an amount not exceeding the mathematical reserve for life insurance contracts expressed in foreign currencies, and up to a maximum of 50 per cent of the total mathematical reserves. In the countries which make express provisions about investment, these are usually intended for the benefit of the national economy, and hence investments are limited to local markets (e.g. Tunisia). The supervisory authority may go even further in tailor-making his regulatory control of investment by specifying the percentage and forms of investment for each class of business (e.g. Jordan). In countries where private companies are not allowed to operate, all insurance business being in the hands of state concerns

(Algeria, Iraq, Libya, Mauritania, Somalia, Southern Yemen and Syria), investment is nevertheless subject to certain rules, likewise aimed at ensuring that assets are invested in such a way as to satisfy both the technical requirements of the companies and the needs of the national capital market. Because in these countries the objectives pursued may be achieved to some extent by more direct state action, the law may be much less explicit and can continually be adapted in a much more flexible manner to the needs of the moment. For example, in Egypt and Iraq, the governments have interfered with companies' management to achieve social objectives, such as investment in housing.

The criteria of security, yield and liquidity must be taken into account when investments are selected. Many Arab countries have specific limitations (an authorised list of investments) on a life or non-life insurer's investment. Although similar policies are pursued in many other developing countries, in many cases capital markets are not well developed so that there are fewer investment activities and opportunities in these countries than in the developed countries. This may impose further limitations on investment policy and the choice of types of investment. In the Arab countries, some of the most extreme restrictions are those of Iraq and Syria. For example, in 1970, 43.1 per cent of the total investments of the three Iraqi insurance and reinsurance companies were deposited with government banks at an interest rate of approximately 6 per cent. The share of deposit of the total investment increased substantially during the period 1970-78 and reached 82.1 per cent in 1978 (see table 4.2). Such a policy was not attributed to supervi-

Table 4.2

The Share of Deposit at Banks of the Total Amount of Investment in the Iraqi Market
(I.D 000's)

Year	National Ins. Co.			Iraqi Life Ins. Co.			Iraq Re			Total		
	Deposit at banks	Total investment	Deposit total inv.	Deposit at banks	Total investment	Deposit total inv.	Deposit at banks	Total investment	Deposit total inv.	Deposit at banks	Total investment	Deposit total inv.
1970	2250	5254	42.8	1352	2934	46.1	1370	3345	41.0	4972	11533	43.1
1971	2750	6568	41.9	1247	3284	38.0	2340	4382	53.4	6337	14234	44.5
1972	2900	8105	35.8	1514	3384	44.7	3345	5485	61.0	7759	16974	45.7
1973	4150	9775	42.5	1925	4052	47.5	4275	6701	63.8	10350	20528	50.4
1974	6750	12301	54.9	2543	4887	52.0	5669	9920	57.1	14962	27108	55.2
1975	13200	20440	64.6	3538	6074	58.2	9888	13198	74.9	26626	39712	67.1
1976	26200	34205	76.6	4325	7205	60.0	13412	16957	79.1	43937	58367	75.3
1977	34500	40600	85.0	5180	8494	61.0	16154	20105	80.3	55834	69199	80.7
1978	38125	44721	85.3	6569	10043	65.4	20201	24298	83.1	64895	79062	82.1

Source: Annual reports of the General Insurance Organization, Iraq.

sory regulation or government direction. All three companies were incompetently managed due to the inexperienced and unskilled investment personnel. The central concern in this investment policy is that the interest rate never exceeded 6 per cent which was far below the inflation rate, bearing in mind the companies were not required to follow such a policy. In this case companies were thereby endangering the welfare of both their policyholders and their national wealth. Given the lack of management expertise possessed by many companies throughout the region, a case could be made for the enactment of legislation requiring companies to invest in a diversified range of assets.

4.3.2.3 Control of Premium Rates.

State control of premium rates is common in many countries. The objectives may be to ensure that premiums:

(i) are not inadequate because that would imperil the insurer's financial stability;

(ii) are not excessive; and

(iii) discriminate fairly between different classes of risk.

Thus government supervision may aim to protect consumers from the dangers of monopoly power on the one hand and destructive competition on the other. However, rate regulation itself may have disadvantages, for example if it delays changes in premium rates in response to changing risk factors or inhibits innovation in premium rating, so possibly acting as a barrier to new competition.

Amongst the 21 Arab countries, premium rates are subject to

state regulation in 11 countries. The commonest form of regulation involves the supervision of minimum tariff rates for some classes of insurance (notably, fire, motor and marine cargo) which are binding on all insurers operating in the country, as, for example, in Algeria, Egypt, Iraq, Morocco, Somalia and Syria.

The case for tariff rates rests on the operation of the law of large numbers; that is, instead of each insurer having to fix premiums on the basis of his own limited claims experience, a tariff association can pool the claims data of all of its members and thereby reduce the degree of sampling error in its claims analysis. Despite such advantages, it does not necessarily follow that uniform tariffs binding on all insurers are in the best interests of consumers (see the U.K. Monopolies Commission Report, 1972, pp.16-19), and the above technical argument in favour of tariffs obviously does not apply if individual insurers do not maintain adequate records, or the combined experience of the whole market is too limited to provide reliable loss statistics. Unfortunately, that is the case in many Arab countries. For example, mortality tables, which are the basis for life assurance tariffs, are produced only in Egypt and Iraq: insurers in other Arab countries have to rely on foreign mortality statistics.

Consequently apart from the larger Arab countries, notably Egypt, Iraq, Morocco and Syria, where tariff associations calculate their own premium rates, tariffs are often based on British, French and other data.

Whatever the technical basis or the origin of the tariff, it usually has to be submitted to the supervisory authority, though

in some countries, e.g. Kuwait, the authority only supervises the tariff structure for compulsory motor insurance.(1) However even when law confers certain powers on the supervisory authorities, they often leave insurers considerable liberty in tariff matters, and only ask to be informed of the rates or the technical bases used.

In the countries where insurance is nationalized, rate fixing is rarely left exclusively to the insurance companies; usually tariff control is left to the same body which is in charge of insurance supervision. In Egypt this role is performed by the Egyptian General Insurance Organization and in Iraq it is performed by the State Insurance Organization and its Technical Committees; in Syria, the approval of the Ministry of Economic Affairs and Foreign Trade has to be obtained (UNCTAD, 1972, p.67). According to the same source(pp.101-4) the governments of North Yemen, Lebanon and Sudan do not regulate their tariffs.

Only a few governments control commission and management expenses. The strictest regulations in this field are to be found in the countries where the tariffs are controlled. Except in a few special cases in life assurance, commissions are usually related to premium income with maximum permitted loadings varying from 10 per cent to 30 per cent.

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(1) In many Arab countries, following a decision of the supervisory authorities, motor tariffs, for instance, have been increased due to the poor experience of the last few years. For example, particular measures have been taken in Morocco to reorganise the premium rates of motor insurance. These measures are (UNCTAD, 1980, p.20): "(a) merit rating; rating will depend not only on the use and power of the vehicle but also on the age of the driver, how long he has had his driving licence, his previous accident record and the age of the vehicle, (b)penalization of bad drivers; the premium increase can be up to 100 per cent of the basis premium; drivers who have not caused an accident will receive a rebate of up to 30 percent of the basic premium, and (c) adaptation of tariffs to cost of living increases and the price of the spare parts, the 1973 tariff has been increased by 30 percent to take account of rises in this respect."

In Morocco the supervisory authority allows a maximum commission of only 18 per cent for agents and 15 per cent for brokers. In Tunisia, commission on motor vehicle business is subject to an upper limit. It is difficult to apply similar control over the management expenses, and in most of the countries this factor is excluded from the legislation. Morocco, however, is an exception: a Ministerial Order of 1967 imposed a management expense ceiling of 27 percent of the premium income for insurance companies in the motor vehicle branch, which they may not exceed under penalty of withdrawal of their licence, (this follows French practice).

4.3.2.4 Reinsurance regulation

There are many factors which determine the proportion of risks to be retained by insurers and reinsurers. Insurers are free in all Arab countries to decide the size of their retention capacity. Retention limits are a function of the size of the risks and the financial capacity of the insurer, who is faced with the problem of balancing his commitment according to the number and size of risks, with a safety margin added to the pure premium and the accumulated free reserves. These are complicated problems which, it is thought can best be solved by the insurer concerned. The supervisory authorities refrain from interfering even though mistakes may gravely affect not only the stability of a company but even a country's balance of payments in the event of excessive recourse to reinsurance abroad. In some countries measures are taken to influence retention limits in an indirect way, such as the policy of the Moroccan government of concentrating the market on fewer but larger insurers, or

the nationalisation of other markets.

Regulations governing reinsurance institutions in Arab countries are very much connected to their status and relationship to the state. Accordingly a distinction must be made between those applying to reinsurance institutions functioning in the public sector, which enjoy a total or partial monopoly of the reinsurance in their respective markets, and those governing reinsurance institutions in the private sector.(1)

In the countries in which reinsurance institutions are state-owned, they are given a partial monopoly of reinsurance. If direct insurers have to make compulsory concessions to these state institutions, they are free (except in Algeria) to cede the excess over their retention capacity to foreign reinsurers. This is the case, for example, in Egypt, Iraq, Kuwait, Morocco, Sudan, and Tunisia. In Algeria, the Compagnie Centrale de Reassurance has 100 percent of the surpluses of domestic insurers and it retrocedes its surpluses abroad. Table 4.3 shows the government participation in reinsurance written in Arab countries.

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(1) Gerathewohl (1980, pp.578-79) has pointed out that some countries like Belgium, France, Luxembourg, the Netherlands, and a large number of developing countries do not have any kind of reinsurance company supervision, while others, such as Austria, Germany, U.K. and U.S.A., do have such supervision, but along very different lines. In Europe (O.E.C.D., 1963, p.31), except in the Netherlands and the U.K, the law relating to direct insurance contracts does not apply to reinsurance.

Table 4.3

Government Participation in Reinsurance Underwriting

Country	Historical Development	Present Position
Algeria	All insurance companies were nationalised between 1966 and 1967. A pool was created in 1971 to write all reinsurance business. The Compagnie Centrale de Reassurances was formed in 1975 as a state owned enterprise.	The 'CCR' has a monopoly of placing reinsurances abroad. 5% of each reinsurance treaty must be ceded to the African Re.
Bahrain	No history of government participation in reinsurance underwriting.	No government participation in reinsurance underwriting.
Egypt	All insurance companies were 'Egyptianised' in 1957. The 'Egypt Re' was formed in the same year. Nationalisation took place in 1961.	The 'Egypt Re' receives a 30% compulsory cession, introduced when the Company was formed. 5% of each reinsurance treaty must be ceded to the African Re.
Iraq	The National Insurance Co. of Iraq was formed by the government in 1950 to operate in a free market. The 'Iraq Re' was formed in 1960. Nationalisation took place in 1964.	The 'Iraq Re' receives a compulsory cession of 25% of all types of business as well as writing more than 40% of all reinsurance treaties.
Jordan	No history of government participation in reinsurance underwriting.	No government participation in reinsurance underwriting.
Kuwait	The Kuwait Re was formed in 1972.	Companies cede 20% of their insurance business to Kuwait Re on a voluntary basis.
Lebanon	No history of government participation in reinsurance underwriting.	No government participation in reinsurance underwriting.

Table 4.3 continued

Country	Historical Development	Present Position
Libya	Insurance was nationalised in 1969. The Libya Insurance Company became the sole company.	The government has a one-half interest in the 'Arab Union Re' which receives a 10% compulsory cession of non-life Libyan business. Libya Insurance Company cedes also 25% of its reinsurance treaties to the Mediterranean Insurance and Re Company. In addition, 5% of each reinsurance treaty must be ceded to the African Re.
Mauritania	Insurance under monopoly control of the state company, the 'Societe Mauritanienne d'Assurances et de Reassurances.	The SMAR may write inwards reinsurance business and also has full control over the outward placement of all its own reinsurances. 5% of each reinsurance treaty must be ceded to the African Re.
Morocco	The Societe Centrale de Reassurances was formed in 1961 as a semi-government owned company which receives a compulsory cession 5%.	The 'SCR' now receives compulsory cessions of 10% plus up to 50% of all treaty reinsurance. Also 5% of each reinsurance treaty must be ceded to the African Re.
Oman	No history of government participation in reinsurance underwriting	No government participa- in reinsurance underwriting. Foreign insurers must offer a share of 15% of all acceptances to Omani insurers.
Qatar	N.a.	N.a.
Saudi Arabia	No history of government participation in reinsurance underwriting	No government participation in reinsurance underwriting.

Table 4.3 continued

Country	Historical Development	Present Position
Somalia	Insurance under monopoly control of the state, the 'State Insurance of Somalia'.	The State Insurance of Somalia has full control over the outward placement of all its own reinsurance. 5% of each reinsurance treaty must be ceded to the African Re.
Sudan	Insurance was 'Sudanised' in 1975. The 'National Re' was formed in 1974 with majority state ownership.	There is no compulsory cession but companies cede 20% of non-life reinsurances to the 'National Re' on a voluntary basis. 5% of each reinsurance treaty must be ceded to the African Re.
Syria	Insurance was nationalised in 1963. The General Insurance Organisation is the only company transacting insurance business in the country.	The 'General' may write inwards reinsurance business and also has full control over the outward placement of all its own reinsurances. The Syrian government owns one-half of 'Arab Union Re' which receives a 10% compulsory cession of all Syrian business.
Tunisia	The 'Societe Tunisienne d'Assurances et de Reassurances' was formed in 1960 and is a majority state-owned company. The 'Tunis Re' was formed in 1981.	The 'STAR'manages the 'Fonds de Garantie' for the Government. This receives the 10% compulsory cession of all reinsurance business. Receives treaty cessions. The country cedes 5% of each reinsurance treaty to the African Re.
United A.E.	No history of government participation in reinsurance underwriting.	No government participation in reinsurance underwriting.

Table 4.3 continued

Country	Historical Development	Present Position
South Yemen	Insurance was nationalised in 1970. The 'National Insurance and Reinsurance Company' is the only company.	The NIRC may write inwards reinsurance business and also has full control over the outward placement of all its own reinsurances.
North Yemen	No history of government participation in reinsurance underwriting.	No government participation in reinsurance underwriting.
Dujibouti	No history of government particpation in reinsurance underwriting.	No government participation in reinsurance underwriting.

Source: (1) Neave (1977).
(2) Crowe (1982).
(3) Wood (1983).

Private reinsurance is usually governed by laws applying to direct insurance, as in Morocco and Kuwait, on the grounds that there is no essential difference between reinsurance and direct insurance, so that it is logical to apply the same laws, regulations, and government supervision to both. However, due to the international nature of reinsurance operations some of the provisions applied to direct insurance cannot be applied in the same way to reinsurance. These include the rules relating to the establishment of technical reserves and their investment. If the direct insurer is required to hold funds representing the technical reserves for his total commitments and make investments accordingly, reinsurers in that case must be exempted from such obligations.

4.4 Prohibition to Take Out Insurance Abroad

The purposes of insurance laws and regulations might be only partly achieved if insurance could be freely taken out abroad. For this reason, most Arab countries prohibit the insuring abroad of property situated within the country, persons resident there, or liability for risks there incurred. In Morocco, it even goes so far as to declare the insurance contract null and void, although this nullity may not be pleaded against the insured, whether policy-holders or beneficiaries in good faith. Kuwait and Jordan have general prohibitions on insurance abroad, but exception is made for life assurance. Table 4.4 shows those Arab countries which forbid, and those which permit insurance with non-resident insurers.

Table 4.4

Insurance With Non-Resident Insurers

Forbidden		Permitted
Algeria	Morocco	Bahrain
Egypt	Oman	Qatar
Iraq	Somalia	Saudi Arabia
Jordan	Sudan	U.A.E.
Kuwait (1)	Syria	
Lebanon (1)	Tunisia	
Libya	South Yemen	
Mauritania	North Yemen	

(1) Except for marine policies.

Arab countries are not unique in imposing such restrictions, which are also common amongst developed countries.(1)

As far as domestic coverage of risks is concerned, it is clear that insurance transactions connected with international trade, especially insurance of carriage of goods, present the most difficult problems. Depending on whether the conditions of sale are stipulated as f.o.b. or c.i.f., the transport risk is borne by importer or exporter, and the insurance is therefore taken out by the former or the latter. The terms of the commercial contract govern the matter and that is why the insurance legislation of a number of countries refers to the terms of the contract of sale which the seller and buyer are left to negotiate freely.

In Iraq, the state indirectly plays a part through the credit institutions, by avoiding the placing of marine insurance abroad. The banks are instructed not to open letters of credit on other than a C. and F. basis. This means that whenever a letter of credit is involved for the importation of goods into Iraq, insurance must be effected in Iraq. The governments of many other Arab countries

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(1) For example, France, Ireland, Italy, Portugal, Greece, Spain, and Turkey forbid the taking out of insurance abroad. Some countries tacitly allow insurance to be placed abroad (Austria, Belgium, Denmark, Germany, Iceland, Netherlands, Norway, Sweden, Switzerland and United Kingdom). Furthermore, some of these countries (Denmark,Iceland, Norway, Sweden), especially in the case of life assurance have restrictions for exchange control reasons. In Denmark, Iceland, Norway and Sweden, transfers of life insurance premiums are subject to certain restrictions from the exchange control authorities (O.E.C.D. 1963, p.32). Since the removal of exchange control on 13th December 1979, U.K. residents (including corporate bodies) have freedom to insure their risks abroad, except for some classes of insurance subject to compulsory insurance regulation which must be placed with companies authorized by the government to write such business in Britain. (Carter, 1974-78, 7.4-02).

also require that all goods imported must be insured locally with domestic companies. This point will be discussed further in chapter eight.

Such practices are common amongst developing countries, many of which now require local cover for imports, and in some cases for exports too. UNCTAD (1980, p.11) has reported that by the end of 1979 some 30 developing countries employed this strategy, which has led to complaints in certain developed countries. For example, in the United States, the American Institute of Marine Underwriters has complained to the government about the obstacles and restrictions to United States trade. Some developed countries pursue a different approach. In France, for example, it has been stated that:

> "insurance connected with the performance of contracts which involve preferential credits granted by France should be underwritten on the French market. The Department of Insurance and the Department of the Treasury have worked out a clause for insertion in financial protocols or financial implementing conventions concluded with countries which receive credits of this kind. The clause provides that contracts financed under the protocol in question are to be invoiced at the FOB price, but that if the insurance is handled by a French company it may be financed through Treasury loans or guaranteed private credits. This clause appears in the financial protocols concluded with nearly all the countries which negotiated preferential credit agreements with France in 1975, including Bangladesh, Morocco, Brazil, Syria etc.". (L'Argus, 1976).

4.5 Regulation for Compulsory Insurance

Most Arab countries have enacted compulsory insurance laws in respect of the following risks:

(a) Motor Liability:

The majority of the Arab countries have passed laws requiring the owners of motor vehicles to take out public liability insurance. This obligation is usually embodied in special laws, and regulations other than the general laws which are applicable to insurance companies and insurance transactions. Whether by means of special law or general legislation governing insurance, most countries have found it necessary to introduce the principle whereby compensation for damage suffered by third parties as a result of a traffic accident is guaranteed. Regulations governing motor third party liability in the Arab countries are given in table 4.5.

(b) Employer's Liability:

The second most common type of compulsory insurance is employer's liability. Such business is carried on by a single state-owned company, or several companies, or may be by an authorized institution. Unfortunately, information about such insurance in the Arab World is unavailable.

Some Arab countries have also extended compulsory insurance provisions to include:

1 - Fire and life insurance on mortgaged real estate (e.g. Iraq).

2 - Fire for the productive sector, fire and hail for the

Table 4.5

Regulation Governing Third Party Liability Insurance in the Arab World.

Country	Legislation	Compulsory liability cover for nationals & foreigners	Statutory minimum sums insured			Choice of insurer	Rating
			Private cars	Motor Cycles	Other vehicle categories		
Algeria	Ordinance 74-75/ 30.1.74. & 75-58/ 26.9.75. Decrets 80-34 to 80-37, 16.2.80.	Yes	Unlimited	Unlimited	Unlimited	Monopoly of S.A.A.	Compulsory tariff
Egypt	Compulsory motor third party liability insurance law 652 of 1955	Yes	Unlimited	Unlimited	Unlimited	Free choice from among admitted companies	Uniform tariff for all co's but different tariffs according to type of vehicle
Iraq	Law No. 52 of 1980 as from 1.1.81, compulsory insurance against vehicle accidents	Yes	Unlimited	Unlimited	Unlimited	Monopoly of National Ins. Co.	New uniform tariff to be put in force as from 1.1.81.
Jordan	Civil law 1.8.76.in force as from 1.1.79.	Yes	'Blood money' depend upon tribal decision JD5000 per event	Same as for private cars		Free	Tariff to be approved by Controller of Insurance
Kuwait	Traffic Law 67/76 Ministerial Order 81/76 Law of Torts 6/1961 amended by Law 42/67 & 73/6	Yes	Unlimited, except in case of death KD 10,000			Free	Uniform tariff
Lebanon	Civil Code Penal Code	No	-	-	-	Free	Free
Libya	Law 28 of 30.3.71.	Yes	Unlimited	Unlimited	Unlimited	Monopoly of Libya Ins. Co.	Compulsory tariff determined by Ministry of Economy
Morocco	Decrees 9.6/8,7/12, 8.37. 20.8.65. Arretes 6.9.41. - 14.12.78.	Yes	Dh 1m.	Vehicle up to 2 horse power DH.500,000 others: DH 1m.	DH. 1 m occupants insurance: DH.100,000 per sect. minimum DH.1m.	Free choice from among co's admitted by the Ministry of Finance	Ministry of Finance must approve tariffs.
Oman	Legislation drafted	Yes	-		-	-	Bahrain tariff
Saudi Arabia	-	No	-	-	-	Free	Free

TABLE 4.5 continued.

Country	Legislation	Compulsory liability cover for nationals & foreigners	Statutory minimum sums insured				Rating
			Private cars	Motor cycles	Other vehicle categories	Choice of insurer	
Somalia	Compulsory T.P.L. motor insurance law	Yes	Sh.60,000 per event Sh. 20,000 per person Sh.10,000 m. damage	Same as for private cars	Sh. 120,000 per event SH. 20,000 per person Sh. 10,000 m.damage	Free	According to cubic capacity, weight, no of seats & service.
Sudan	The road traffic ordinance 15.4.19-45/1962/1974.	Yes	Unlimited	Unlimited	Unlimited	Free	Free
Syria	Decree-Law 71 of 26.9.53, motor vehicles law of 1.10.74.	Yes	Unlimited	Unlimited	Unlimited	Not free	Uniform tariff
Tunisia	Law 60-21 of 30.11.60. Decree 61-80 of 30.1.61.	Yes	TD. 50,000 per claim and per vehicle	Same as for private cars	Unlimited	Free	Tariff approved by supervisory authority
North Yemen	Sharia Law	No	Unlimited per event YR.96.000 per person. YR.300.000 m. damage	Same as for private cars	Same as for private cars	Free	Free
South Yemen	Motor Car Insurance (Third Party Risks) Law 12/1976	Yes	Unlimited	Unlimited	Unlimited	Monopoly of of National Insurance and Reinsurance co.	Uniform tariff
			(No cover for material damage)				

Source: Extracted from Swiss Re. Sigma, No. 11/12, 1980 and No. 12. 1983.

Note: (1) Only in Algeria and Iraq no-fault liability is adopted.

(2) Information about Dujibouti and Mauritania is unavailable.

(3) Motor third party liability is compulsory in Bahrain, Qatar and U.A.E. - Abu Dhabi only, (Wood, 1983).

socialist agriculture sector, and fire and water damage for public and co-operative institutions entrusted with real estate management, e.g. Algeria, (Crowe, 1982, p.11).

3 - Third party liability for aircraft (e.g. Egypt and Jordan).

4 - Architects' and contractors' liability (e.g. Algeria, Egypt, Iraq, Syria).

5 - River craft (e.g. Iraq).

6 - Hunters and work accidents (e.g. Morocco).

7 - Personal liabilities for airports, transporters, doctors and medical officers (e.g. Algeria).

All the countries of Western Europe have some types of insurance which are compulsory. Such insurance has to be taken out either with private insurers established in the country or with state or semi-state institutions. The sectors in which compulsory insurance has most often been instituted are motor third party liability, workman's compensation and employer's liability.

4.6 Nationalisation of the Insurance and Reinsurance Market

As mentioned in chapter three, nationalisation of insurance in the Arab World was a political act associated with nationalisation of wide sectors of the economy. Nationalisation of the insurance industry has taken various forms. In a number of countries the practice has created a state-wide monopoly of the insurance business (e.g. Algeria, Iraq, Libya, Mauritania, Somalia, Syria, South Yemen); in other countries the market has been partly nationalised and

some local private companies have been allowed to continue to function (e.g. Sudan).

In the countries where the whole insurance market is nationalised it is usual to include in the legislative text the basic regulations which give the nationalised company a monopoly. This was the case, for example, in the People's Republic of Southern Yemen; its Nationalisation Act provides that:

> "the Insurance Authority, Economic Agency for the Public Sector and National Planning, is responsible for insurance and reinsurance business in the People's Republic of Southern Yemen including the formulation and execution of a national insurance and reinsurance policy. This policy should be based essentially on the following principles: all insurance and reinsurance business shall be carried on exclusively by the Public Sector, as of the date of nationalization; the private sector may not carry on business of this kind without the express authorisation of the national insurance and reinsurance company, nor may insurance policies covering risk and liabilities in the People's Republic of Southern Yemen be taken out abroad". (UNCTAD, 1972, p.79).

The nationalisation of insurance and reinsurance in other countries was carried out on basically the same principles. Moreover, when direct insurance has been fully nationalised, reinsurance is often nationalised as well. It has already been pointed out that Iraq and Egypt have reinsurance companies which are answerable to the government, and whose main task is to co-operate with the direct insurance

companies in order to increase their capacity - in particular, their underwriting capacity. Reinsurance in these countries has been modified to be operative within the framework of nationalisation; usually a decree is passed to establish a reinsurance company and to regulate business relations between this company and direct insurers in areas such as co-insurance, reinsurance and retrocession.

In countries where insurance is in the hands of a single nationalized company, administrative and technical supervision differs from the type of supervision exercised in countries where insurance is in private hands. This point has already been noted in the case of the People's Republic of South Yemen. In Syria authority to supervise the nationalised company, rests with the Ministry of Economic Affairs and Foreign Trade. In Iraq and Egypt the situation is identical, but the fact that between the government and the insurance companies there is a body which holds the shares of the companies and determines their policy introduces a new element into the supervision (UNCTAD, 1972, p. 83). Thus the Egyptian General Insurance Organisation and the General Insurance Organisation of Iraq are the insurance supervisory authorities in these two countries.

4.7 The Problems of Supervision.

The advent of Arab insurance practices and the growth in insurance business as a result of economic development, together with the increasing interdependence of the economies of the Arab countries, has given rise to the need for legislation in order to control and supervise insurance and reinsurance companies. This legisla-

tion to some extent, has promoted the development of Arab insurance markets, by providing for both guidance and supervision of the activities of insurance companies, thus protecting policyholders' interests and national wealth. On the other hand, the existing state of supervision may hinder the development of these insurance markets. This is attributed to the fact that:

(i) the state may not supervise the insurance industry in an effective manner, and

(ii) there is still difficulty in formulating and operating insurance regulations (which is common in countries at an early stage of development). This legislative and supervisory obstacle to the development of Arab insurance markets can be illustrated by a few examples:

(a) Owing to the absence of active competition, insurance services rendered policyholders by the insurer(s) of a nationalised insurance market are inadequate. Premium rates applied for some classes of insurance are high in order to realise huge profits. In other words, the premium rates offered to the insured are higher than those available from a competitive market. Clearly this conflicts with the reasonable premium rates objective sought by the nationalised insurance market.

(b) Sometimes the investment objectives, like security, yield and liquidity, may collide with an insurer's management activities when the latter is demonstrably lacking in competence or reliability. Recent experience of the Iraqi insurance market provides a striking exam-

ple of unsound investment practice.

(c) In most of the Arab countries there is excessive recourse to foreign reinsurance markets. The blame is not to be shouldered by insurance companies alone - insufficient insurance supervision carries the biggest share of the blame.

(d) The insurance regulations in some Arab countries may increase the cost of insurance for policyholders (thus colliding with the objective of policyholder protection), since the compulsory reinsurance cessions to the national reinsurance companies have to be made on terms less advantageous than those available on the international markets.

(e) The availability of some types of insurance, e.g. Workmen's compensation, motor third party liability etc., has emerged as a fundamental objective of inurance regulation. Although these classes possess considerable economic and social value, up to the end of 1983, they have not been enforced in some Arab countries.

The above situation leads to the question of whether it might be possible for Arab insurance regulations to be improved. One possibility would be for an advisory committee to be formed within the General Arab Insurance Federation (GAIF). This committee should be directed to:

1. Study the financial position of the insurance companies and suggest improvements in their free capital in order to strengthen their financial base.

2. Examine and suggest measures to check the premium rates of various classes of insurance, to bring about more reliable rates.

3. Study the demand for foreign reinsurance and encourage the supervisory authority to take steps to prevent under-retention. The purpose of this is to ensure that the companies retain a minimum written premium for their own account, and that foreign reinsurance is used only for risks exceeding the capacities of these companies.

4. Examine the existing provisions regarding investment policy and find an adequate policy which would generate a good income as well as providing security, (co-ordination of the investment activities with the economic objectives of the government must be taken into consideration).

5. Propose new laws concerning those classes of insurance deemed to be social in nature, e.g. motor third party, workmen's compensation etc., to ensure that coverages are available.

If the GAIF is unable to establish such a committee it may be useful for Arab countries wishing to examine their insurance regulations to call upon the assistance of the United Nations Development Programme (UNDP). Such a programme includes insurance experts from developed countries available to advise developing countries on such matters. (International Insurance Advisory Council, 1972 p.18).

4.8 Conclusions

The history of insurance legislation and supervision shows that in most countries its present form is the result of gradual growth and there are very significant differences in the legislation and supervision in different countries. There are also still some countries where insurance companies and insurance contracts are free from any form of regulation and supervision, e.g. Bahrain, Saudi Arabia and U.A.E. In these countries, insurance companies are governed by the normal practice that applies to commercial companies.

One can look forward with some hope to an improvement in the existing regulations and that the issue of new ones will continue to expand, in part due to the absence of insurance legislation in some Arab countries.

Government interference in the insurance industry is found in both developed and developing countries, but because the insurance markets of the developed countries are reinforced by a high standard of insurance legislation and supervision, their insurance industry is fairly strong and well-developed. On the other hand, where the insurance supervisory authority has insufficient experience, as in most Arab countries, one cannot expect that the insurance industry will grow properly and the aims it seeks to achieve will continue to remain unattainable objectives.

Furthermore, it would seem to be that most Arab countries have no regulations with regard to fixing of retention limits or controlling the proportion ceded to foreign reinsurers. This situa-

tion coupled with unskilled underwriters, has led to smaller individual retentions by the companies and underutilization of their actual retention capacity. Clearly, there is an urgent need to increase the experience of supervisory personnel by training facilities, so that Arab countries can promote the sound growth of their domestic insurance and reinsurance markets.

CHAPTER FIVE

THE EFFECT OF LARGE RISKS ON MARKET CAPACITY

5.1 Introduction

There is no generally accepted definition of what constitutes a 'large risk', though it is clear that the word large is used in a relative rather than in absolute sense so that views of what is large varies both between insurers and over time. For example the UNCTAD Secretariat (1977, p.3), has said that:

> "in most cases, a judgement on whether or not a given risk is a large risk reflects an individual view of an insurance underwriter who has in mind his own underwriting capacity".

However, there are many risks that exceed an individual insurer's underwriting capacity but would not be regarded as 'large' a point implicit in the reference to the spreading of the risk internationally in the following definition:

> "Target risks are those that have to be spread between underwriters: the loss expectancy involved being in many cases of such magnitude that a world-wide spread is required". (The Review, 1957, p. 1342).

Yet the fact that a risk may be reinsured internationally is not a sufficient condition for it to be regarded as a 'large risk'. Insurers operating in countries where there are no restrictions on reinsuring with non-admitted reinsurers frequently place part of their treaties abroad. Before formulating a definition which

deals with this point, one further attempt to define a 'large risk' will be considered. Tofield(1980,p.3) has said that a 'large risk' exists:

> "When investments of very high value are heavily concentrated or various kinds of liabilities represent an unusually high exposure".

A key to what is a 'large risk' lies in the last four words- "an unusually high exposure". It is, judged from the standpoint of exposure to the loss of a single risk (as opposed to one of several collectively exposed to loss from one event, such as earthquake or storm), but of such a size that it exceeds the normal underwriting capacity of local insurers. Thus special insurance and reinsurance arrangements are required to handle a "large risk".

Therefore for the purpose of this chapter, a 'large risk' will be defined as:

> "A special risk of such size and complexity that it cannot be handled in the normal manner. It not only calls for high technical underwriting skills in regards to determining the premium and other terms and conditions, but also the exposure to loss is so high that it is likely to exceed the underwriting capacity of the whole national insurance market after making recourse to its normal reinsurance facilities".

This definition shows that a large risk may require underwriting skills not available locally.

Prior to the economic development programmes of the 1970s there were few large risks in Arab countries. Now the amount of insurance protection required for large risks is measured in millions of dollars, and in many cases in hundreds of millions.

The problems of large risks today are basically the same for underwriters everywhere in the world. However, in the Arab insurance markets, the problems of capacity and technical control may

be more acute than in the developed countries. Although co-insurance and co-operation are growing between Arab insurance markets, no single market, and not even the whole region, can carry those large risks. Therefore it is necessary to have recourse to the international reinsurance markets.

The purpose of this chapter is to show the potential demand for insurance that may strain market capacity, and to discuss the problems which arise from the underwriting of large risks. It is also intended to evaluate the necessary steps which must be taken to overcome placement difficulties.

5.2 Nature of Large Risk and Branches Where They Usually Emerge

5.2.1 Emergence of Large Risks in the Arab Countries

In the Arab countries, rapid economic development relies heavily upon modern technology; industrial plants of high values are constructed and equipped with a great deal of costly machinery. As the Arab countries are importers of technology, they often have no choice but to utilise this technology in its original form, thus leading to the concentration of investment in limited areas, and creating what are known as large risks areas. In the transport industry the trend is towards the adoption of large units, such as jumbo jets, super tankers, large vessels, etc. In mining and oil exploitation, the drilling rigs, off-shore rigs, pipelines, refineries and other installations represent a concentration of

high value equipment. Dams, silos, canals, steel mills, petrochemical plants, nuclear plants, ports, roads, large hotel or residential compounds etc., represent not only high value investment risks but also enormous potential third party liabilities (UNCTAD, 1977, p.3). Therefore, one can classify the large risks in Arab countries into two basic types:

(1) Large public works projects, and

(2) Construction of factories related to the industrial sector.

All this means that large risks are on the increase in the region, and the increase in their value is enhanced by two factors: the large amounts of investment, and inflation. However, within each country the numbers of large risks are still very few and they do vary considerably between countries. In an Arab country, for example, one might find between one and five oil refineries, two petrochemical plants, a few units in marine hull, etc.

Indeed, in the Arab countries large risks can involve a different degree of hazard than in more industrialised countries. This hypothesis has been supported by Gobel (1981, p.44) who has stated in this respect:

> "Two exactly similar industrial plants can represent two entirely different risks, depending on the environment in which they are set up, and the environment of most of the oil-exporting countries differs greatly from that of the highly industrialized countries in regard to climate, educational standard of the population, existing infrastructure, commerce and industry".

Because of these factors, Arab insurers may find themselves

in a market with a high degree of hazardous risks and high value business.

An increase in the risk size will affect the loss severity assumed by an insurer.(1) For example, the risk for an insurer by insuring a high building containing a number of flats is greater than for an equivalent number of single houses. The same is equally true of other types of insurance, such as marine hull, engineering, etc.

In this context, Tofield (1980, p.18) has pointed out that fire and fire loss of profit risks are heavier for modern industrial complexes, than for traditional industries. This is due to rapid technological development; larger industrial areas and a heavily concentrated, higher valued construction; use of sophisticated machines for process control; use of hazardous material (i.e. plastic); etc. All these developments are reflected in the trend towards larger losses and higher loss ratios.

In conclusion, the trends to larger industrial risks lead both to unbalanced insurance portfolios and to larger fluctuations in loss experience. The influence of a small number of large losses on annual claims ratios of even a large national market is shown in the loss experience of the industrial fire and loss of profits business of the German market (see table 5.1). Therefore, the trend to larger risks leads to a greater demand for fire, marine, and other property reinsurances.

Insurers in Germany and other industrial countries do have the advantage of being able to underwrite in addition to a relatively small number of large risks a substantial volume of business composed

(1) It is for this reason that European and American insurers seek to increase the contingency loading of the premium for large risks.

Table 5.1

The Share of the 3,5 and 10 Largest Fire Losses in Total Annual Claims Expenditure

Year	Gross claims ratio in % of the premium earned	The three largest losses %	The five largest losses %	The ten largest losses %
1970	99.7	19.1	24.8	31.8
1971	98.9	23.0	26.8	33.8
1972	60.8	9.5	14.1	22.0
1973	55.9	7.7	11.1	18.0
1974	50.4	5.6	8.0	11.6

Source: Gerathewohl (1980, p.136).

of many small risks independently exposed to loss which help to smooth out the impact of large random losses on the overall claims experience. However even in such markets technological progress leading to the creation of large production units is tending to result in sums insured for large risks growing more rapidly than the total volume of insurance premiums and thus to less balanced insurance portfolios. The problem for Arab insurers is that in many countries they do not have a large base of small risks: most of their premiums for fire, engineering, aviation and marine insurances are derived from medium to large risks.

The degree of imbalance that exists in Arab insurance portfolios can be illustrated by two examples:

(i) In 1977 the total fire premium income of Qatar was just over U$7 million, while the total loss of the petrochemical plant in Umm Said in the same year cost U$76 million. Likewise, the total loss of even the smallest oil refining

plant, in any Arab country, could result in a claim larger than the country's fire premium income.

(ii) In 1980 the EML exposure on the largest Iraqi fire policy was approximately ten times the country's total gross direct fire premium income.

Generally speaking, as a market develops so the problems caused by large risks will tend to diminish, as not only will the size of such risks relative to total premium income decline, but also the increase in the number of large exposure units insured will help to reduce the degree of variability in its loss experience.

5.2.2 Continous Move Towards Large Risks

As mentioned in Chapter two, the slump in the demand for oil has decreased the rate of economic development in the Arab world. Nevertheless, the forecast is for continuing investment in economic development, especially in the oil producing countries of the Arab region, which can be expected to result in the construction of many more large risks of various types. The number of oil processing projects which have reached the construction stage has increased rapidly, and the following examples show different production capacities in some Arab oil producers:

(i) In Saudi Arabia, refinery capacity at present totals 32 million tonnes a year from Jiddah, Riyadh and Ras Tonurah; it is expected to exceed 70 million tonnes a year by 1985-86. A new project refinery is to be constructed at a cost of U$2.6 billion and is designed to

produce 325,000 b/d, (Financial Times, 1980).

(ii) In Kuwait, over the five years 1981-85, the Kuwaiti petroleum corporation will be spending U$5 billion on investment in the oil sector. The main contract is for the U$500 million - U$700 million Mina Al-Ahmadi refinery modernisation. The expansion of the other refinery at Mina Abdullah will cost U$1.5 billion (Financial Times, 1981).

(iii) The cost of developing Qatar's North Dome gas field, and the building of associated plants, is expected to be about U$5 billion (Financial Times, 1981, p.3).

(iv) In Algeria, the gas gathering and liquefication plants have cost hundreds of million U.S. dollars.

Trends towards the expansion of productive capacity are also observable in other products related to the petroleum industry, such as ethylene, methanol, ammonia, urea, etc. The technology associated with the production of these products has become, and is becoming, ever more complex. The OAPEC estimated productive capacity for some basic products in 1977 and 1985 is given in table 5.2. One can see in such enormous productive capacity the key to tomorrow's larger risks.

As has been stated in Chapter two, many Arab countries have invested heavily in the field of petroleum transportation. This has led to the acquisition of many large oil and gas tankers and extensive pipeline construction projects.

Table 5.2

OAPEC Estimated Productive Capacity for some Basic Products in 1977 and 1985

Country	Refining 10^3 b/d		Ethylene 10^3 t/y		Methanol 10^3 t/y		Ammonia 10^3 t/y		Urea 10^3 t/y		Iron-Steel 10^3 t/y		Aluminium		Cement	
	1977	1985	1977	1985	1977	1985	1977	1985	1977	1985	1977	1985	1977	1985	1977	1985
Algeria	115	442	-	120	100	100	990	1980	130	260	500	300	-	130	2500	9000
Bahrain	250	250	-	-	-	330	-	330	-	-	-	-	120	180	-	-
Egypt	285	410	-	-	-	185	570	1400	900	1390	1740	2700	100	170	3800	9500
Iraq	190	600	32	170	-	-	330	1500	500	1600	-	1600	-	-	3000	12000
Kuwait	609	725	-	-	-	-	660	660	800	800	-	-	-	-	1400	1400
Libya	78	358	-	350	-	330	330	1650	-	2300	-	1300	-	110	2500	7000
Qatar	10	60	-	280	-	-	330	660	330	660	400	400	-	-	340	640
S. Arabia	703	2000	-	2060	-	1250	220	720	400	900	-	850	-	-	1500	9800
Syria	100	220	-	-	-	-	-	330	-	350	-	-	-	-	1500	6000
U.A.E.	15	135	-	-	-	-	-	330	-	500	-	1000	-	135	950	1950
Total	2355	5200	32	2980	100	2195	3430	9560	3060	8760	2640	9150	220	715	17490	57290

Source: ENI, "The International Model", Vol. 1, 1981.

Furthermore, there are remarkable developments in industrial projects in several Arab countries. Amongst the oil producing countries, such projects include:

- the new industrial cities of Jubail and Yanbu in Saudi Arabia. It has been estimated that the infrastructure for both will cost US.$35 billion and table 5.3 shows the cost of some of the main heavy industrial projects.
- In south Iraq the largest petrochemical project to date is the US.$1.2 billion Basra petrochemical complex No.1. A fertilizer plant has cost more than US.$.580 million in the same area, and another at Al-Enbar cost US.$1 billion. Work is expected to commence in 1985 and last five years on a proposed new dam in the north of Iraq at a cost of about US.$.1.5 billion. Iraq also aims to be involved in the domestic production of cars, lorries and tractors, possibly as early as 1985; this project will cost more than US.$5 billion. (Financial Times, 1980 and 1981).
- Aluminium Bahrain (ALBA) is a major project which is insured for some US$850 million (UNCTAD, 1982, p.12).
- The Jebel Ali project and the dry dock in Dubai are other massive schemes.

The non-oil producing countries also have a considerable demand for large projects, such as:

- the Kenana sugar project in Sudan which required an insurance cover of US$1.2 billion.
- In Jordan (Financial Times, 1981, p.14), the 1981-85

Table 5.3

Some of the Main Heavy Industrial Projects in Saudi Arabia

Company	Location	Project	Status	Est. cost
Saudi Pecten (SABIC/Shell)	Jubail	Petrochemical	-	US.$2 bn.
SABIC/Mobil	Yanbu	=	Signed 1980	US.$1.6bn.
SABIC/Dow	Jubail	=	-	US.$1.6 bn
SABIC/Exxon	Jubial	=	-	US.$2 bn.
Saudi-Japanese	Jubail	=	Signed Nov. 1979	US.$300m.
SABIC/Celanese Texas	Jubail	=	-	US.$300m.
SABIC/Mitsubishi	Jubail	=	Signed 1980	US.$2 bn.
Petromin/Shell	Jubail	Refinery	Signed 1980	US.$1 bn.
Petromin/Mobil	Yanbu	=	Signed 1980	US.$2 bn.
Petromin/Socal & Texaco	Jubail	=	-	US.$3 bn.
SABIC/Taiwan	Jubail	Fertiliser	Signed, Dec. 1979	US.$360 m.
SABIC/Korf-Stahl	Jubail	Metallurgical	Signed, Mar. 1979	USD.$600 m.
Jubail Rolling Mill	Jubail	=	-	-
Jeddah Rolling Mill	Jeddah	=	Signed, Mid-1979	US.$30 m.
Aluminium Smelter	Jubail	=	Signed, May 1979	US.$300 m.

SABIC: Saudi Basic Industries Corporation.

Source: Financial Times (1980).

plan includes the investment of US$ 450 million in a potash plant on the Dead Sea, a US$ 350 million chemical fertilizer complex at Aqaba, and a US$ 230 million Portland cement plant at Rashidiyeh in South Jordan.

- In Egypt (Financial Times, 1980) there are also large industrial projects, like the US$ 750 million sponge iron plant, and the US$1 billion textile project.

In other fields, such as ports and airports, there are numerous requests for large projects in many Arab countries, which represent many billions of dollars of sums insured.

Finally, the Arab world is witnessing a move towards the establishment of joint Arab projects. Examples of these are:

- the Arab Maritime Company for oil transportation, established in Kuwait in 1972, costing US.$ 1 billion;
- The dry dock of the Arab ship-building and repair yard established in Bahrain in 1974 with investment of US$ 340 million;
- The Arab Petroleum Investment Company (to invest in petroleum related projects and loan financing) established in Saudi Arabia in 1975 at a cost of U$ 1 billion;
- The Arab Company for Petroleum Services (1975, Libya);
- The Arab Navigation Company; and
- The Arab Company for Drugs and Medicines.

In addition, there are two joint Arab projects in Bahrain, the first taking a one-third equity between Bahrain, Saudi Arabia and Kuwait. A US.$400 million Petrochemical project will start production in 1984, and the second plant costing US.$ 300 million, to be owned by the Arab Iron and Steel Company, is due to start operating by the end of 1984 (Financial Times, 1980). All of these

joint projects and others have created large risks which require joint insurance efforts.

Clearly the development of such large risks is placing a considerable demand on the local insurance markets whose ability to cope is affected by:

(i) many of the risks being new and of types virtually unknown to Arab insurers;

(ii) the limited local underwriting and financial capacity;

(iii) insufficient technical know-how.

Consequently it has only been possible to provide the insurance cover required by relying heavily on international insurers and reinsurers. For such companies the problems posed by the large, complex and costly innovations of modern technology, such as power stations, nuclear power stations, super tankers, off-shore and on-shore industrial projects, supersonic aircraft, etc. are not new. Moreover, as long as modern economies and modern technology continue to develop, they will continue to introduce risks of an unprecedented kind.(1) For example, Tofield (1980, p.14) has pointed out that a nuclear power station builtin the course of the 1960's had a capacity of 300 MW (a sum insured for approximately US$ 20 million), while since 1970 the capacity has ranged between 900 MW and 1300 MW. The sums insured for a nuclear power station of 1300MW capacity are around US$ 1.5 bn. Now nuclear power stations with a capacity of up to 2000MW are being forecast. The number of nuclear power stations and their cumulative electrical capacity during the

(1) An unprecedented risk is that of a hydro-electric power station recently completed at Itaipu on the border between Brazil and Paraguay. This project has already been called the largest civil engineering project in the world and will cost around U$ 10 billion. Another example of unprecedented risk is the construction of a gas pipeline in Alaska for the benefit of the U.S. and Canada. The cost of this project is twice that of the Itaipu dam and power station, i.e. U$ 20 billion (Gobel, 1981, pp.41-43).

period 1965-85 is illustrated in figure 5.1. The construction costs of a large offshore gravity platform are the same as that of a 1300 MW nuclear power station.

5.2.3 The Classes of Insurance Affected by Large Risks

Fire Risks and Allied Perils

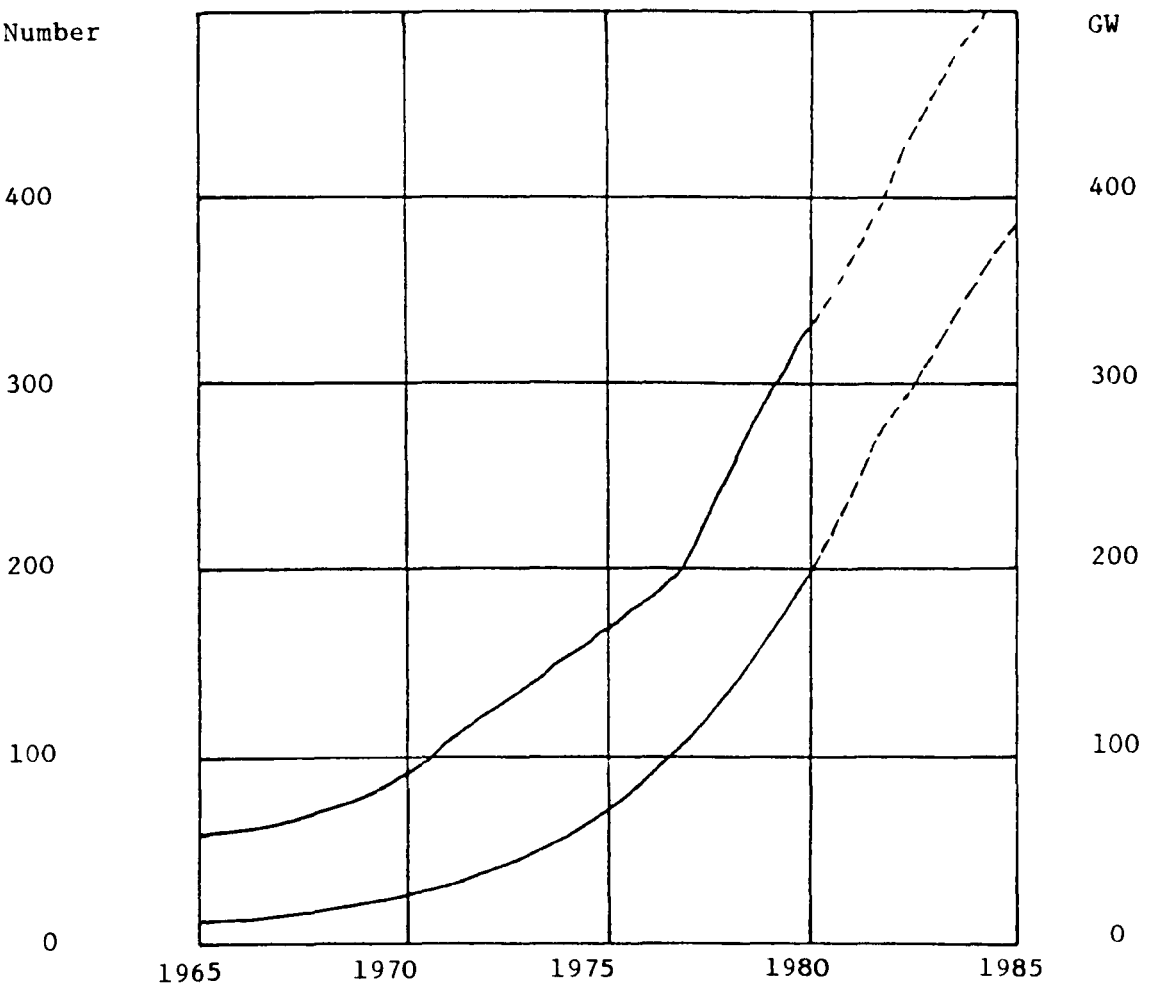
Besides infrastructure projects such as power stations and airports, large scale developments requiring insurance against fire and allied risks have occurred in a number of industries, such as the textile, paper, metal, foodstuff, chemical, iron and steel, motor vehicle and petrochemical industries, and oil refineries.

Although they are no longer unique in terms of size, oil refineries still present fire insurers with particular difficulties. For example, in 1979 the Chouaibiya Refinery, belonging to the Kuwait National Petroleum Company had a total fire sum insured of US$890 million, the Samir Refinery in Morocco was insured for US$ 461 million, and the Libyan National Oil Corporation, insured for US $ 421 million (Aimarah, 1979, p.7). It is not only the magnitude of such risks, but also the degree of hazard associated with the nature of the product involved. In discussing such risks, Patrick (1974, p.3) has pointed out that:

> "the number of fires and the cost of losses are increasing year by year. For the U.S.A. this is now in the region of over 1500 storage tank fires and nearly 6000 refinery fires per annum. There is no reason to believe that the number and kinds of such incidents are materially different in other parts of the world".

Figure 5.1

Number of Nuclear Power Stations and their Cumulative Electrical Capacity throughout the World



Source: Tofield (1980, p.15).

Note: 1GW (Gigawatt) = 1000 MW (Megawatt) = 1,000 KW (Kilowatt)

One can well understand the concern of the Arab insurers and reinsurers, as their fire risks get bigger and more highly complicated.

In October 1979, Ridah (p.4), stated that the number of large risks in the fire portfolio in an Arab insurance company had increased rapidly during the period 1974-78 as shown below, (see figure 5.2):

Range of Risk	Number of Large Risks	
	1974	1978
US$25 m - 50 m.	9	19
US$50 m - 100 m.	1	7
Over US$100 m.	3	10

Engineering Risks

Engineering insurance is extensively used to cover large rural, urban and industrial development projects. Engineering insurance generally furnishes three kinds of cover:

(1) contractors' all risks,

(2) erection all risks,

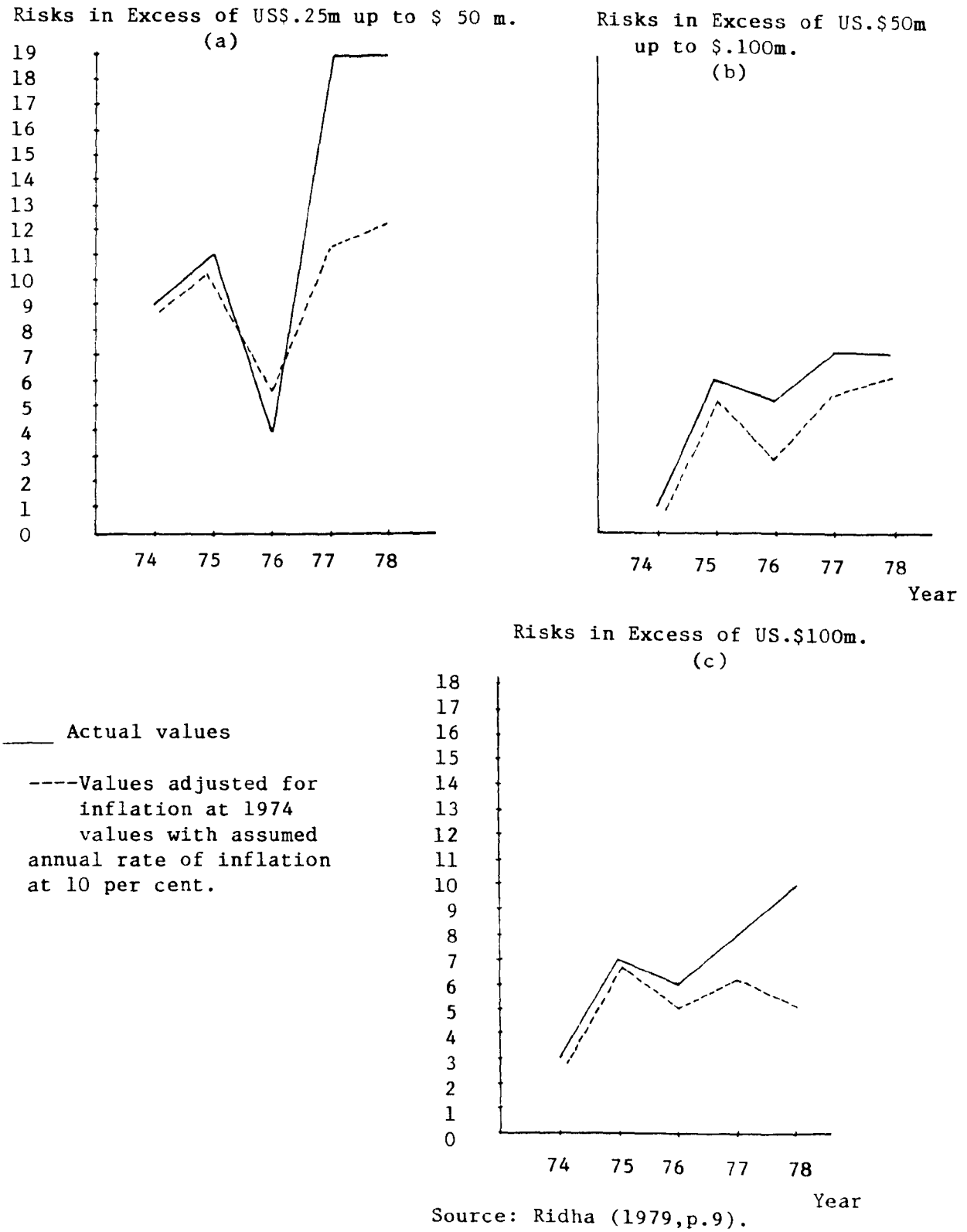
(3) machinery breakdown.

As the Arab countries have developed their economies, the operations of large-scale industrial contractors have encouraged the development of contractors' all risk insurance for the large civil engineering projects.

Fifteen years ago a contract valued in excess of US$ 50 million was exceptional. Today, contract values are among the largest in the world varying between U$ 500 million and several billion dollars. The Arab countries have witnessed many giant contracts,

Figure 5.2

Fire Portfolio in an Arab Company



Source: Ridha (1979,p.9).

the following being some examples:

- Gas gathering and liquefaction plants in Algeria, Iraq, Qatar, Saudi Arabia, etc.
- The construction of a causeway from the Saudi coast across the sea to Bahrain.
- The large number of ports and airports constructed in many Arab countries.
- The hundreds of miles of oil pipeline construction in some oil producing countries.

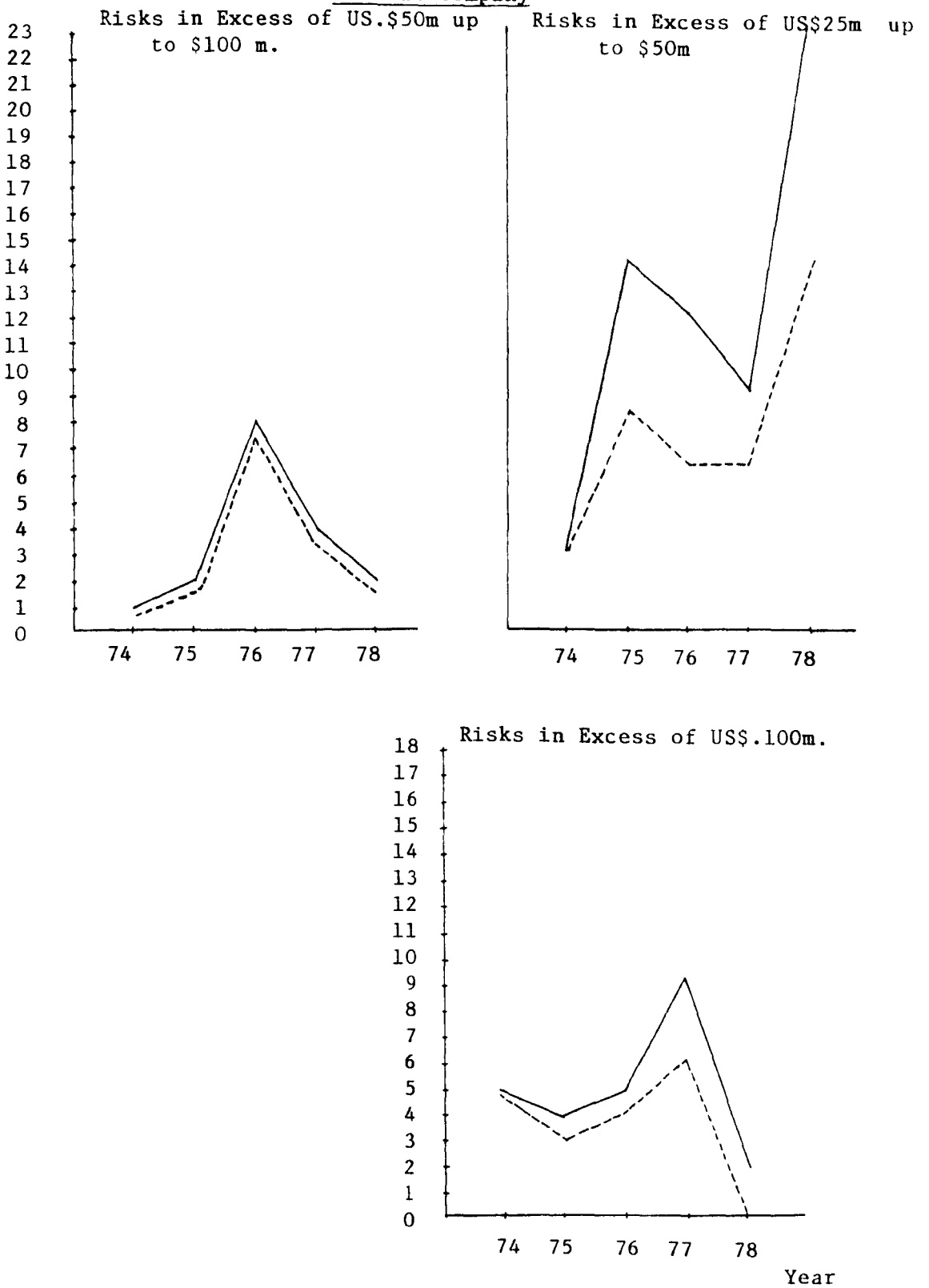
Generally there are a number of features common to all large contracts, notably (Seddon, 1977, p.5):

1. Multiplicity of contractors, often of varying nationalities.
2. Joint venture, frequently involving a national government interest.
3. Special contractual standards.
4. Ferocious competition between contractors to secure the contract.
5. Physical problems of communication at long distance and lack of professional skill in the evaluation and handling of large contracts by insurance companies.

Besides his example of the fire portfolio of an Arab insurance company, Ridha also provided details of the numbers of large risks included in the same company's engineering insurance portfolio, as shown in figure 5.3.

Figure 5.3

Contractor' All Risks and Erection All Risks Portfolio in an Arab Company



Source: Ridha (1979, p.10).

Marine Hull and Aviation Risk

Most Arab countries have their own marine and aviation fleets which are growing in size and sophistication as well as in value. All these fleets are insured locally in the domestic markets.

Over the last decade the potential claims costs of large risks have increased substantially. Since 1970 aircraft hull and liability limits have more than doubled. For example, in 1970 the hull sum insured for a Boeing 747 was between US.$20 million and US.$25 million; by 1982 it had risen to US.$65 million with liability limits of more than US.$200 million. World wide the maximum hull and liability risks exceed even those figures. Jannott (1973, p.2) quotes a maximum for hull and liability of US$ 30 million in 1960, US.$250 million in 1973 and up to US.$ 700 million in 1982. He also pointed out that in the same year 1982, the largest sum insured for product liability was US$1 billion (1983, p.46).

In marine hull, the size of individual risks is also becoming massive, the cost of the Algerian methane tankers, for instance, is more than US.$ 140 million each.

Liability Risks

In addition to marine and aviation, certain other types of industry and industrial activity have given rise to large liability risks in Western Europe and North America. Notable examples are liability risks associated with petrochemical plants, nuclear installations and large multi-storey hotels; products liability for

pharmaceuticals, fertilizers, pest control and certain other types of toxic chemicals, asbestos, etc., and pollution risks. There is now some evidence of the emergence of large liability risks in Arab countries, particularly in connection with the oil and construction industries. However, in general public attitudes towards, and laws relating to, compensation for personal injury and damage to property, plus the lack of insurance consciousness, have limited the demand for liability insurance.

5.2.4 Catastrophe Size Losses From Large Risks

The losses involving large risks can reach catastrophic proportions in the sense of the size of loss relative to the accumulated funds of the insurance markets of Arab countries. All the large risks are being designed and executed in accordance with the latest techological standards, yet losses still occur generally due to either machinery failure or human error.(1) The result can be the total or partial destruction of a very large industrial complex, the collapse of essential work, such as bridges, or dams, the loss of jumbo aircraft or supertankers and/or the pollution of the environment.

Table 5.4 shows some examples of losses exceeding U.$10 million in the Arab countries. The losses fall into three categories; (a) fire and explosion; (b) aircraft; and (c) ships. There have been several major CAR/EAR losses in the region, but unfortunately information is unavailable.

(1) Concerning the highly sophisticated projects transferred to the Arab countries, approximately 35 to 40 per cent of losses, especially operational losses, can be traced to human error (Negrier, 1982, p.26).

Table 5.4

Some Losses with an Amount of Damage exceeding U$10m. (1972-82).

Date	Place/Country	Cause of Loss	Amount of Damage
19.12.72.	Gulf of Oman	Sinking of the 'Sea Star' after collision	US.$ 12m. MD
18.4.76	Rumaila-Iraq	Fire in oil well	US.$ 12 m.Fire
31.1.77.	Essaouira-Morocco	'Exotic' runs aground following explosion	US.$ 15m. MD
3.4.77.	Umm Said-Qatar	Bursting of liquid-gas tank	US.$ 76m. Fire
11.5.77.	Abqaiq-S. Arabia	Bursting in oil gathering centre	US.$ 54.5m Fire
1.6.77.	Jaddah-S. Arabia	Seaspeed Dora capsizes	US.$ 15m. MD
4.6.77.	Abqaiq-S.Arabia	Explosion in oil gathering centre	US.$ 10.6mFire
16.4.78.	Abqaiq-S.Arabia	Explosion and fire following burst	US.S 53.7mFire
14.3.79.	Doha-Qatar	Crash Alia Boeing 727	US.$ 12m. H&L
25.4.79.	Nassiriyah-Iraq	Fire in telephone cable factory	US.$ 22.5m. Fire
19.8.80.	Riyadh-S.Arabia	Crash and fire of Saudi Arabi airline L 1011-200	US.$ 60m. H&L
21.2.81.	Dubai/UAE	Fire in aluminium works	£1.8m. Fire loss & £10.2 m. LOP
1.3.81.	Thumrait/Oman	Crash of Jaguar combat aircraft	US.$ 16m. Hull L
20.5.81.	Gulf of Oman/UAE	Explosion and fire on board tanker	US.$ 11.3m.Hull L
20.8.81.	Shuaiba/Kuwait	Fire in oil refinery	US.$ 50 m.Fire
Jan/Dec. 1981	Shatt al-Arab/Iraq	Damage to various ships, following act of war between Iraq/ Iran.	US.$ 55 m.Hull (Greek insurers) Yen 13 bn.Hull : (Japanese insurers)
11-17.6.82	Beirut/Lebanon	Destruction of 5B-707 /720 during act of war.	US.$ 11 m.Hull L
3.4.83.	IlesCani/Tunisia	Running aground of freighter.	US.$ 12.5m.Hull L
2.6.83.	Rouiba/Algeria	Fire in motor vehicle factory	Alg.Din. 330 m. Fire loss
15.7.83.	Oran/Algeria	Fire in warehouse	Alg.Din. 90 m. Fire loss
23.9.83.	Abu Dhabi/U.A.E.	Crash of Gulf Air B. -737.	U $25m.Hull & liability

Source: Swiss Re, Sigma, different issues of January for 1973-1984.

Furthermore, given the increase in oil production in some countries, the potential exposure to large losses resulting from accidental pollution on sea or on land is high in the Arab region. Recently there have been large oil slicks in the Arabian Gulf largely as a result of war between Iraq and Iran. Although the cost of the damage is yet unknown it would seem that the potential severity of pollution risks, in terms of damage, is more than that of many other large risks. For example, it has been reported (Foresight, 1981) that the total losses from the tanker 'Amoco Cadiz', which ran aground off the coast of Brittany, France, in March 1978, may be as much as US$175 million.

5.3 Large Risks and Their Underwriting Problems

Before discussing the main problems in underwriting large risks in the Arab World, it is reasonable to say that (a) the expulsion of foreign insurers has placed greater responsibilities on local insurers, and (b) though other nations have encountered the same problems, they are more severe for the Arab countries.

5.3.1 Assessment of Large Risks

The first stage of underwriting any large risk is its assessment. This usually requires the surveying of the risk by a specialist who later prepares a report giving a full description of the risk to be insured. His report must also contain an evaluation of the risk and recommendations of terms and conditions which will

be applicable to the cover. Because the report includes vital information about the risk, and plays an essential part in its rating and placing, it is important that it should be acceptable to the insured, insurer and reinsurers. (UNCTAD, 1977, p.7).

Furthermore the underwriter will rely heavily on the surveyor's assessment of the estimated maximum loss (EML)[1] in order to fix his company's retention. Therefore it is essential that the surveyor should possess the technical skill required to assess risks accurately.

The calculation of EMLs is a difficult task anywhere, and very prone to both under- and over-estimation. The explosion in June 1974 at the Flixborough plant which resulted in the destruction of the plant and losses amounting to US$ 60 m. is a case in point. Although the EML was estimated at only approximately 20 per cent, the explosion actually destroyed about 80 per cent of the plant. Likewise the EML for the Umm Said's petrochemical plant was fixed at 25 per cent but the damage extended to more than 90 per cent of the plant. Three lessons can be drawn from these examples:

(1) unless all possible hazards are recognised an EML can be a highly misleading figure;

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(1) The term E.M.L. was defined by the Reinsurance Offices' Association (R.O.A.) in 1974 as follows:
"An estimate of the monetary loss which could be sustained by insurers on a single risk as a result of a single fire or explosion considered by the underwriter to be within the realms of probability. The estimate ignores such remote coincidences and catastrophes which may be possibilities but still remain unlikely".

(2) even experienced underwriters and surveyors in the developed countries can badly under-estimate possible losses; and

(3) errors of such magnitude could lead to solvency problems on the part of the insurers.

On the other hand, if EMLs are set too high, then the insurers will be inclined to retain too little for their own accounts and might encounter difficulties in obtaining all of the reinsurance they will then require. In the past reinsurers often accepted business without checking the reliability of an EML. Today after having been badly affected by a number of cases of serious under-estimation, there is widespread recognition that they should ask for underwriting information to enable them to check the EMLs for large cases. (Oberschelp, 1977, pp. 2-3).

5.3.2 Rating of Large Risks

Local Arab market experience is not sufficient for the rating of large risks for two reasons. First, the advance of technology is rapid and its several applications continue to bring new hazards, which require risk evaluation by specialists. Secondly, nationally there are too few large risks to yield sufficient statistical data for a local market to calculate reliable premium rates. The larger the risk, the less statistical data there is available and the less certain can the insurer be about the rate of premium he charges. The original rating of large risks often tends to be lower than

that of smaller risks of a similar type. The reason for such practice is based on the argument that it may be possible to divide a large risk into several separate risks spread over a wide area, so that the probability of a total loss is less under such circumstances than for smaller risks (Patrick, 1974, p.10). However on occasions experience has shown that the bigger and more complex the risk, the more there is to go wrong with it. Also in the industrial fire and fire LOP classes of insurance, for instance, large risks have often produced very large losses causing random fluctuations in the insurers claims experience. Therefore it is arguable that the larger is a risk the larger should be the contingency (fluctuation) loading of the premium. This concept is explained by Berliner (1982, p. 61) who writes:

> "The larger the risk carrier's participation in the cover of a large risk, the more fluctuation loading must increase in relation to the pure risk premium".

In addition, each large risk has its own special features which need specific inspection for the purpose of rating and other conditions. Highly qualified chemists, physicists , engineers, architects, and geophysicists can give useful assistance in this respect, but usually Arab insurers do not have ready access to such skills. Consequently in cases where risks have been rated locally some diffículities have arisen when extra cover has been sought from the international market, because the insurers and reinsurers have considered rates insufficient.

5.3.3 Settlement of Claims Emanating from Large Risks

As the size of large risk claims is usually very large, and because reinsurers have a heavy involvement, they tend to intervene in the handling of such claims. Recently, therefore most reinsurance treaties have incorporated a claims co-operation clause, which entitles the reinsurers to play a role in the settlement of large claims.

Large claims can present particular problems that inflate settlement costs as compared with the handling of the claims for smaller risks. There are few people in the Arab region capable of either assessing a large claim or effecting repairs to a large modern industrial plant or other construction, so resulting in delays in effecting repairs. Moreover many large risks have been sited in remote areas, so making communications difficult for all concerned, thereby adding to the delays.

5.3.4 Determining Retentions for large Risks

This point will be discussed in Section 5.4

5.3.5 Insufficient Technical Expertise

Recent developments have brought with them a battery of new risks, like nuclear power stations, jumbo jets and ships, electronics, off-shore rigs etc., which face insurers and reinsurers today; this development in technology is not going to stop. However, it seems there is always a gap between the increasingly specialised

technology of industrial concerns and the insurer own knowledge of these matters (Gerathewohl, 1974, pp. 32-33), not only in the Arab insurance markets but amongst international insurers and reinsurers too.

Taking all the above problems into account, the Arab insurance markets are not (at present) in a position to provide a sufficient underwriting capacity for large risks.

5.4 Retention Problems and Reinsurance of Large Risks

Since Chapters 9, 10, 11 and 12 are devoted in their entirety to examining the determination of retention limits, only a brief discussion of retentions for large risks will be offered here. Because of the large size and high exposure of the large risks, substantial underwriting capacity is required to provide the required insurance cover [1] so that further capacity has to be found from insurance and reinsurance from abroad.

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(1) ".... Large risks are not normally insured at a purely national level even in the industrial countries. As insurance values grow, both industrial and developing countries become increasingly dependent on the capacity, experience and smooth functioning of the international reinsurance market which, in fulfilling its distributive function, is in a position to "break up" large risks into fragments small enough to be maneagable. An attempt to establish national autarky in this area would only create a false sense of security and a situation which would not be able to withstand any serious strain over a period of time". (Tofield, 1980, p.6).

5.4.1 Large Risks and Underwriting Capacity

The retention limits of Arab companies are low due to various factors; among these may be noted:

- generally low capital and free reserves;
- the small volume of their premium income;
- the lack of qualified personnel; and
- the imbalance of their portfolios.

A limited retention level is quite natural for any new developing insurance market which previously had insured almost totally outside the region. However with the continuing development of the insurance market, the absolute level of premium being retained within a certain country should increase. Nevertheless because of the factors mentioned above, experience has shown that insurers in the Arab World still retain a very marginal share of these very large risks, as shown in the following examples (the monetary units are not shown to maintain confidentiality).

One Arab insurance company cedes its CAR/EAR large risks into its engineering Quota Share and surplus treaties with, in 1980, a maximum retention of 375,000. It then purchases an excess of loss cover to protect its retention, so reducing its net liability to 75,000. The proportion of those retention limits to the total value of each large risk covered was as follows:

Selected Large Risks covered under engineering Q/s and surplus treaties	Sums Insured	Amount of Retention	Retention as a % of sum insured	Amount of retention reduced by XL cover	Net retention as a % of sum insured
Dam	485 m.	375,000	0.077 %	75,000	0.015 %
Petrochemical plant	425 m.	375,000	0.088 %	75,000	0.018 %
Water purification plant	350 m.	375,000	0.11 %	75,000	0.021 %
Railway project	280 m.	375,000	0.13 %	75,000	0.027 %
Power station	200 m.	375,000	0.19 %	75,000	0.038 %
Cement factory	160 m.	375,000	0.23 %	75,000	0.047 %

In 1978, another Arab insurance company was faced with the acceptance of three large fire risks with sums insured of 750 million 800 m., and 850 m. These risks were ceded to its fire Quota Share and surplus treaties, with a retention limit of 0.5 million. Thus the company's retention share to the total sum insured of each risk was 0.067 per cent, 0.063 per cent, and 0.059 per cent respectively.

Even if a share of each large risk is ceded to a local reinsurance company, the total amount retained within the market still may not reach one per cent of the large risk's value.

Many of the emerging insurance companies in the Arab countries still have relatively small portfolios, with most of the premium income coming from large risks related to their country's development efforts resulting in an imbalance not only of their portfolios but of

their total national markets (UNCTAD, 1980, p.34). This is illustrated by table 5.5 which shows the small number of large risks insured in the United Arab Emirates.

Table 5.5

Aviation Portfolio in the U.A.E. Insurance Market, 1979

Region	Number of policies	Total gross premium income
Abu Dhabi	15	DH. 8,885,000
Dubai	8	DH. 1,622,000
Sharjah	1	DH. 11,000
Umm Al-Qiwain, Ras Al-Khaima, and Fujeira.	3	DH. 134,000

Source: Ministry of Planning (1982).

5.4.2 Capacity Suppliers

The suppliers of insurance capacity are to be found on three levels:

First, there is the local insurance market which comprises the direct companies who issue the policy, and the local reinsurers who accept the reinsurance business. As noted above, individual Arab direct companies retain only a very small portion of large risks and even when several are interested by way of coinsurance generally the total retained remains a very marginal share of the total risk. Within the local market the local reinsurer(s) which receive compulsory or voluntary cessions and treaty acceptance from the direct insurers likewise maintain only small retentions.

Second, direct insurance companies and reinsurance companies may supply further capacity on a regional level. Some direct companies participate in regional co-insurances particularly in the case of joint-venture projects between Arab countries, and there are also reinsurance business acceptances. Although the national and regional reinsurance companies, and the Arab regional pools, play a vital role in increasing the capacity of the region, they still cannot absorb the whole of a large risk.

Third, on the international level, there is the London market which provides a massive capacity, especially in marine and aviation; this market can absorb any risk however large it is in these classes. Arab business is also placed in Zurich, Munich, New York etc. The direct companies who participate in reinsurance from abroad and the professional reinsurers, together represent a high capacity. It appears that in recent years the direct companies have gained in importance.

5.4.3 Reinsurance of Large Risks

In general, insurers use the same reinsurance methods for placing the large risks as for the ordinary risks; that is, proportional treaties, non-proportional covers, and facultative reinsurance. However, the underwriting limits of reinsurance treaties are usually limited, because the premium volume of a reinsurance treaty and its maximum limits must be balanced. Therefore as

the large risks require very high underwriting limits, the reinsurance treaty will absorb only a very small portion of those risks and leave the majority to be covered facultatively. Although facultative reinsurance has gained greater significance during the past few decades, insurers will continue to cede the large risks to their automatic reinsurance treaties for the reasons mentioned in Section 5.5.1.

Finally, when referring to the large capacity needed for large risks, one is often faced with uninformed competition from the large capacity available in the international market. At the same time, large risks often attract reinsurers by their high volume of premium. Therefore, the large risks can be placed easily in a greedy market with the minimum of underwriting information.

5.5 Measures for the Better Handling of Large Risks

Various steps could be taken to improve the handling of the insurances of large risks in Arab countries, and the proportions of those risks retained locally. They need to be taken at four levels - the individual Arab insurance companies; the domestic markets; the regional markets; and the international markets.

5.5.1 The Individual Company Level

The shortcomings experienced by individual companies in the underwriting of large risks could be mitigated in three ways:

(i) Strengthening company finances: generally companies need to increase both their capital and free reserves, and the volume of smaller conventional risks they underwrite. Larger, better balanced portfolios would reduce the potential aggregate claims fluctuations, and larger reserves would enable them to withstand larger losses.

There would be considerable merit in companies forming special reserves to cover the unexpected developments and catastrophes that may arise from large risks. Thus insurers should be encouraged to set aside out of pre-tax profits a reasonable part of their earnings for building up such reserves.

(ii) Adequate technical facilities: although difficulties face the local insurance companies in the underwriting of large risks, many of them consider it a duty to provide cover locally for such risks as live evidence of their positive role of supporting the national economy. The inspection of the large risks is a task for experts: if such experts are not available locally, then their services must be obtained from elsewhere (Makar, 1978, p.65). Although internationally there are available individual consultants and specialist bodies (surveyors, engineers, etc.), mainly Arab companies rely on the international reinsurance brokers and professional reinsurers. The training of local people should be treated as a matter of priority. The more highly trained specialists an insurer has, the more efficiently will he use his capacity in each case. For example, suppose an insurer bases his retentions on EMLs. If due to lack of knowledge about a

particular type of risk the person responsible for estimating the EML incorrectly fixed it at 40 percent instead of 20 percent, all of the insurers involved would cut their acceptances by half thereby depriving the market of existing capacity. (Gerathewohl, 1980, p.181).

As regards the rating of large risks, the inadequacy of local experience is such that Arab insurers of necessity must pay regard to foreign experience. However, the over-rating of large risks is generally not in the interests of the economy of a country since this increases the cost of foreign reinsurance, particularly when these risks are heavily reinsured abroad. Thus the Arab insurers need to rate their large risks accurately which calls for considerable technical expertise.

It is in the interest of insurers and the economy that insurers should have the technical ability to advise on and enforce appropriate standards of loss prevention.

(iii) Adequate reinsurance arrangements: improvements in the reinsurance arrangements for large risks can be achieved by establishing proper retentions and optimum use of automatic reinsurance facilities.

To fix an insurance company's retention a proper measurement of risk exposure is required. Such measurement requires a reliable classification of values among different risks and assessment of the estimated maximum loss. A company can safely increase its retention on a fire policy only if the insurance covers a number of independent risks, otherwise

it might just as well base its retention on an EML.

When the insurer has exhausted the retention, the next step is to use all the reinsurance coverages. As regards large risks, the automatic reinsurance facilities are considered the best form of coverage for many reasons, viz,

(1) they provide an automatic cover

(2) they allow reasonable commission

(3) they can bring profit commission

(4) they may give the right to retain technical reserves.

Therefore as a general rule, attempts should be made to raise the limits of treaties to enable them to absorb a greater proportion of large risks. That, however, can only be achieved by increasing the volume of business (and so premium income) available to reinsurers, otherwise the reinsurance treaty will become unbalanced. In exceptional cases it may be better to exclude a large risk from the treaty when the risk concerns an unusual class of hazard and if it is likely to produce high or repeated losses. In this case, the establishing of retentions and arranging special facultative reinsurance cover will depend on the nature of the risk.

5.5.2 Steps at the Level of the Domestic Market

Markets composed of more than one insurer should be considered in this section in order to illustrate the mobilization of market capacity and expertise. The use of full domestic underwriting

capacity increases the insurers' premium income; this will, in turn, help those insurers to increase their retained premium income and improve their technical balance. The best methods of achieving this are the sharing of large risks amongst insurance companies on a coinsurance basis, and the creation of local committees for the handling of large risks.

The increase in capacity could be provided by coinsurance, as is indeed practised in varying degrees in individual classes of business and national markets; when there is no coinsurance, the direct companies retain a small proportion of the risk. On the other hand, it may be useful to create a local technical committee serving only the insurance of large risks. The main function of this committee would be to provide consultation in this field in order to safeguard all the parties concerned, e.g. the insured, the insurer and reinsurer. The creation of such a committee would be justified primarily by the necessity to advise direct insurers in stating insurance conditions (e.g. inclusions and exclusions), calculating premium rates, as well as of introducing special loss prevention measures, and determining the EML and retention limits.

5.5.3 Subregional and Regional Co-operation among Arab Countries

Due to the limited ability of any national market to cover large risks, co-operation with other insurance markets is needed. In order to overcome the particular capacity problems of Arab insurance markets, it was thought appropriate to try to combine their activities at a regional level (Makar, 1978, p.69). The principle has been accepted by governments and insurance officials in many

Arab countries, and various forms of subregional and regional insurance co-operation are being started, such as regional reinsurance institutions and pools, insuring major joint projects and joint placement of reinsurance abroad.

5.5.3.1 National/RegionalReinsurance Institutions and Pools

The establishment of national/regional reinsurance companies as well as reinsurance pools will be discussed in Chapter seven.

5.5.3.2 Regional Co-operation on joint Venture Projects and Joint Placement Abroad

Arab governments have participated in many large scale joint projects covering a number of different economic activities. The insurance of these projects is handled by one company and the covers split on a co-insurance basis between the markets concerned. According to the agreement between the governments who financed these projects, each insurance market must have a share equivalent to the contribution of its country to the share capital of the project. The surpluses, after exhausting the local capacity, are placed on a facultative basis abroad.

An example of this procedure is the insurance of the Arab Ship Repair Yard (ASRY) dry dock which is carried by a consortium of the national companies in each of the seven shareholding countries led by the Bahrain Insurance Company. In 1980, the total premiums of this risk were over US.$ 1.3 million, and these were spread among 23 companies according to their country's stake (Financial Times, 1980). Some Arab countries in order to improve the terms available from foreign insurers, have also co-operated through the

joint placement of some types of large insurances, such as marine and aviation fleets. As mentioned in Chapter three, several large risks are handled on a joint placement basis For example, amongst the countries of the Maghreb, (Algeria, Tunis, Morocco, Libya and Mauritania), joint placement has been arranged for shipping and air line fleets with a priority sharing of business between the Maghrebin markets, so providing for a good distribution of premiums and risks among themselves.

5.5.3.3 Regional Committee for the Assessment and Rating of Large Risks

Although it was suggested earlier that committees be established in local markets to assist in the handling of large risks,in many Arab countries there is a lack of knowledge and experience throughout the market. Therefore, it may be more practical to establish a central committee for the whole Arab region. This committee could help to build up a technical staff and give assistance in underwriting large risks. It could also play a vital role in minimising the problem of assessment and rating and form the basis of central records on all large risks in the area.

An appropriate body for taking the initiative in setting up such a committee would be the General Arab Insurance Federation and it should, for this purpose, seek co-operation with national and international markets. In doing so the following points need to be borne in mind:

1. The General Arab Insurance Federation would need to create technical staff, representing the committee, from the Arab insurance markets, i.e. technical experts from the industry concerned should be asked to join this committee.

2. The technical committee must collect detailed information on individual large risks from all the Arab countries, and, if possible, from the whole world.
3. It should ascertain what has already been achieved in the area of large risks in the region.
4. The indexing of large risks into categories according to class and type of risk.
5. An increase in co-operation with the international markets (some reinsurers have very useful information which would serve as a basis for the work of the technical committee).

5.5.4 Co-operation between the Arab Insurance Markets and the International Market

All the measures discussed so far are aimed at improving underwriting locally and minimising the region's reliance on the international reinsurance market. Undoubtedly, the international market has contributed and will continue to contribute, to the growth of the Arab insurance industry. There has been good co-operation between both markets in the handling of 'jumbo' risks in the Arab countries. The Arab markets always welcome assistance from the international market, particularly when this market is in a position to provide vital services to the Arab insurance markets in a number of ways. The international markets can increase the knowledge and experience of their clients. This can be achieved by:

(i) giving advice on the underwriting and handling of large risks,

(ii) assisting insurers in training their staff including joint risk examination, joint estimation of E.M.Ls, joint rating, joint claim settlement etc. All this assistance is the only practical way for them to obtain vital knowledge and experience.

This practical and important aid to the Arab insurance industry from the international market is not inspired by purely altruistic motives. The complex and interdependent nature of international finance and insurance necessitates an essentially symbiotic relationship between developed and developing nations. Aid and advice from the first world, in the form of training and education, leads to increased efficiency in the domestic Arab insurance industry, and hence to increased stability. In addition, there is 'goodwill and gratitude', although intangible, it has a habit of being translated into the concrete of business ceded to the international market from the Arab domestic insurance market.

5.6 Conclusions.

Arab insurance and reinsurance companies lag years behind the technological and economic development which have taken place in the region. However, historically, the insurance industry has always been faced with the problem of providing cover for new and more complex large risks; whenever these problems have arisen, eventually, solutions have always been found. Advances in modern technology will present the insurance industry with great challenges

in the future, but, with co-operation between companies and markets, solutions to these new problems will also be found.

The expansion in the numbers of national insurance companies in recent years has made increasingly evident the dramatic technical and capacity problems which they face. As sums insured and EML values of large risks increase considerably, insurers are unable to achieve a balance between risk exposure and the premiums generated from these risks. Limited capacity and unbalanced portfolios result in much of the large risks business being reinsured on the international insurance markets. Experience shows that, with the help of these markets, it has generally been possible to find full cover for all types of large risks in the Arab region.

However, coverage on the international market is not a complete solution to the problem of underwriting large risks. The remainder of the solutioncan only be provided by domestic insurance companies, and amongst the measures which they might consider are the following:

(i) Premium rates, insurance conditions, loss prevention and loss settlement must be adequate in order to ensure the placement of large risks.

(ii) Insurers must plan to build up reserves and possess adequate free capital

(iii) Coinsurance among companies within the market must be encouraged where it does not already exist.

(iv) To achieve a large distribution and spread of large risks, regional and sub-regional co-operation must be considered and encouraged.

(v) Insurance companies should also try to instil a 'risk consciousness' amongst the insured and his staff, in order to reduce loss through incompetence, ignorance, carelessness, etc.

CHAPTER SIX

THE EFFECT OF NATURAL HAZARDS ON THE ARAB INSURANCE MARKET

6.1 Introduction

Any definition of a natural catastrophe [1] must take into consideration the effect on people either through loss of life or material damage. Disaster casualties are a function of the type, magnitude, duration and frequency of the catastrophic event. The greater the impact of a disaster, the higher the need for insurance coverage. This is particularly the case where the productive resources of a country are badly affected. In Arab countries this may apply particularly to the petroleum sector which in many cases is the economic mainstay of that country.

In general, insurers and reinsurers recognise the importance of both being able to provide cover for natural catastrophes and the problems involved in doing so. Consequently the insurance industry worldwide has increased its efforts to get better control of the risks of natural hazards. However, insurers suffer from a dearth of data for estimating the frequency, severity and cost of such risks. This problem clearly affects the Arab countries.

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(1) Thorne (1984, 167) defines the term 'natural catastrophe' as follows:

'In simple terms the words "any sudden, severe, unexpected and fortuitous happening of a natural origin causing great damage to property and/or loss of life" will suffice for the present'.

The purpose of this chapter is to describe the degree to which the Arab countries are exposed to natural hazards, to show that these countries have been badly affected by them, and to indicate that insurers and reinsurers will have to face substantial problems due to the scarcity of information, including scientific information, about the hazards themselves.

This theme will be illustrated by reference to four of the natural hazards common to Arab countries, namely:

- Flooding
- Earthquake
- Salt Weathering
- Sand movement and dust storms.

The last section of this chapter goes on to consider the awareness, and insurance coverage, of natural hazards, followed by a concluding discussion on the evaluation and accumulation of risk, which is based on a study of the type of evidence that can be drawn from earth sciences. The results of that study are summarised in the Appendix showing the exposure of Arab countries to the four types of hazard, and the centres of population and major development projects in relation to those hazards.

6.2 Flooding

In the Arab world, flooding has been a principal feature in a folklore which stretches over 3 millenniun. There are Sumerian legends from as early as 2000 BC, which contain the essentials of the later Babylonian stories of the flood. In C.1000 B.C.,

this legend was incorporated in the Gilgamesh epic, which was familiar to Babylonian Assyrians, and Hittites (Munich Re, 1973, p.3). In Egypt the Nile floods have been recorded for more than 5000 years and these records are the oldest for any scientific gauging of rivers. The most important date in the Egyptian calendar was the one on which the annual inundation took place, and records of flood levels can be traced back to 3000 - 3500 B.C., while remains of what is possibly the world's oldest dam, built between 2950 and 2750 B.C., are still in existence near Cairo (Ward, 1978, p.3).

Floods result from a number of different basic causes, such as heavy rainfall snow melt and tidal surges. To these natural hazards must now be added man-induced floods such as those resulting from the failure of dams and other water control work (Figure 6.1).

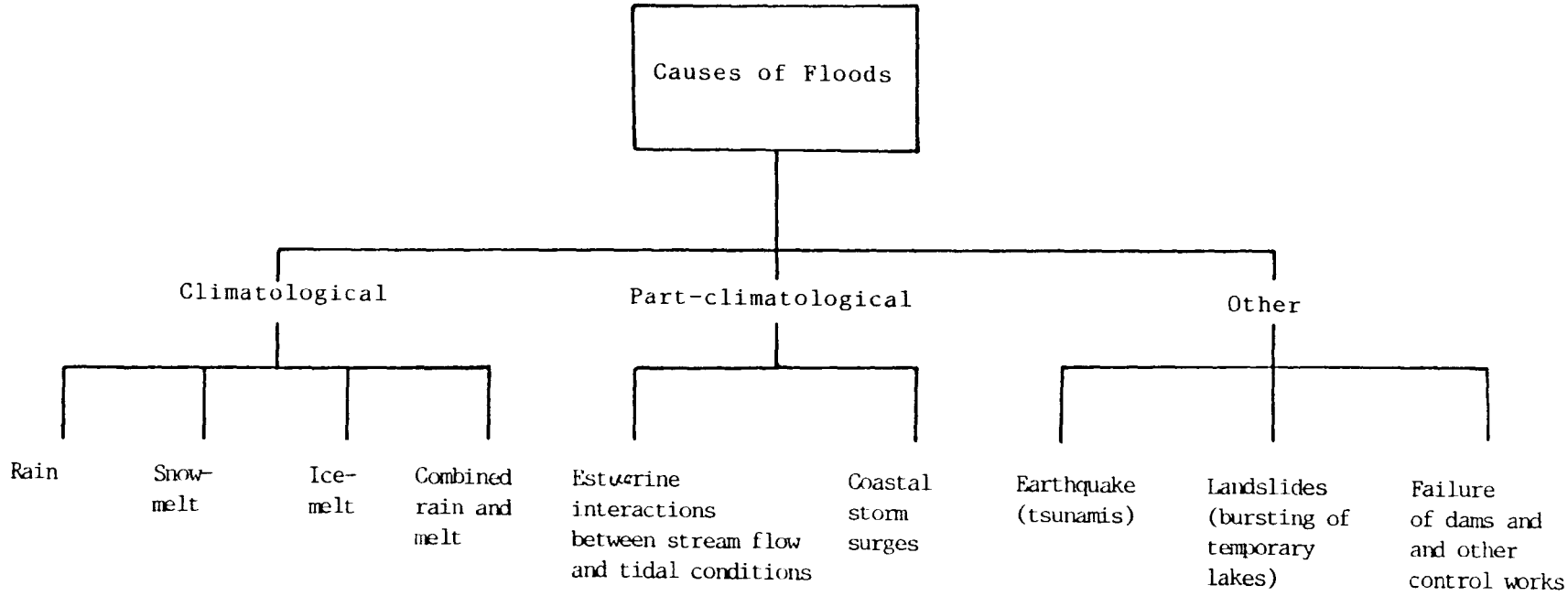
In order to assess the flood risk and how this is related to insurance and reinsurance, a brief discussion is required on flooding along river channels, across alluvial fans, coastal flooding and a brief mention of man-induced floods.

6.2.1 River Channel Flooding

Any river derives its flow either from surface runoff or from an underground source or both. A sudden rainstorm soon finds its way to the river and a flood will probably occur. However, there is a time lapse between a rainstorm and when water actually reaches the river. This time-lapse may be the same over the whole of the catchment area of a river and the tributaries may all discharge into the main river simultaneously. If this happens then a severe flood is quite likely to occur. But if the timing varies in different tributaries, then the main river may not actually flood, since the

Figure 6.1

Causes of Floods



Source: (Ward, 1978, p.6).

excess water is spread over a period of several days (Gresswell, 1962, p.55-65).

In addition to rainfall, the rapid melting of snow or ice can be responsible for severe flooding. Such a flood can normally only occur once each year, in the spring, resulting in a single flood, but when snow melt is slow it may not happen at all. The severity of snowmelt floods depend on two factors: first, the depth of snow accumulation and second the rate of melting. Ice melt is slower than snow meltand by itself is rarely responsible for severe flooding. (Ward, 1978, p.28).

A river flood plain results from the storage of sediment within and adjacent to the river channel. In this connection there are two principal processes involved. The first is the accumulation of sediment within the river channel. This type of within-channel accumulation is mainly associated with below-bankfull discharge. Secondly, suspended sediment carried by overbank discharge across the valley floor may be deposited and supply a further increase of flood plain either generally over the flooded surface, or occasionally, locally along the channel margins to form levees (Cooke and Doornkamp, 1974, p.107).

There are several methods of measuring river flood. One of the commonest is based on the discharge rate which provides the basis for most methods of predicting flood magnitude. Discharge is, by definition, the amount of water passing through the channel cross-section in unit time. Analysis of discharge frequency necessarily involves magnitude, since very high discharges are rare (great magnitude correlates with low frequency). Whereas low discharges are common (small magnitude correlates with high frequency).

Because discharge is a product of mean depth, width and velocity of flow, and because its relations to characteristics such as area of inundation and sediment load have been described, curves can be drawn relating these variables to discharge (see figures 6.2 and 6.3). The recurrence-interval of each flood is computed by the simple formula:

$$RI = \frac{N + 1}{M}$$

Where RI = the recurrence interval, N = total number of years of record, M = the rank order of discharge. Calculations of flood frequency at gauging stations depend almost entirely upon the length and quality of the record. Table 6.1 shows the annual flood on the Tigris at Mosul and Baghdad, and the Euphrates at Hit and Hindiya. The table also shows that, in general, the Tigris is in maximum flood in April and the Euphrates in May. Figure 6.2 gives an indication of the extreme discharges of the Tigris and Euphrates that can occur. For example, a discharge of 7340 m^3/sec. at Mosul (on the Tigris) and 7366 m^3/sec. at Hit (on the Euphrates) occur with an interval of nine years (on average), whereas discharges of the same rivers of 1700 m^3/sec. at Mosul and 1400 m^3/sec. at Hindiya occur with recurrence intervals of 1.13 year for both.

Table 6.2 shows that the maximum recorded discharge of the Tigris (10,900 m^2/sec. at Baghdad) has a recurrence interval of once in one hundred years, whereas a discharge of 5230 m^3/sec. occurs on average once in every two years. Graphs, such as Figure 6.2 can be drawn from short runs of data to allow an estimate to be made of the likelihood of high (flood-level) discharges. This is illustrated in Figure 6.3.

Table 6.1

Annual Floods of the Tigris and Euphrates Rivers at Mosul, Baghdad, Hit and Hindiya 1965-1972

Year	Ranking Order	Extreme Discharge Maximum M^3/sec.								Recurrence Interval RI
		Tigris				Euphrates				
		Mosul	Date	Bagh-dad	Date	Hit	Date	Hind-iya	Date	
1965	1	7340	3.4.69	3925	5.4.69	7366	13.5.69	3271	12.5.72	9.0
1966	2	6758	28.1.66	3922	16.4.71	6654	3.5.68	2894	19.5.69	4.5
1967	3	6316	2.5.72	3783	23.4.72	6092	23.5.67	2510	1.5.68	3.0
1968	4	5180	20.4.68	3215	4.4.68	5214	10.5.72	2288	9.5.67	2.25
1969	5	4950	5.5.67	3660	19.5.67	4910	23.5.71	2098	14.5.68	1.8
1970	6	3740	19.4.71	3601	21.4.65	4484	5.2.66	1983	2.5.65	1.5
1971	7	3243	30.4.65	2521	25.4.66	3632	6.5.65	1775	22.5.71	1.29
1972	8	1700	9.4.70	2292	23.4.70	3254	14.5.70	1400	15.5.70	1.13

Source: Compiled from the UNESCO, discharge of selected rivers of the World, Vol. 111 (part II), 1974, pp.60, 62 and Vol. I, 1969, pp. 32, 48.

Table 6.2

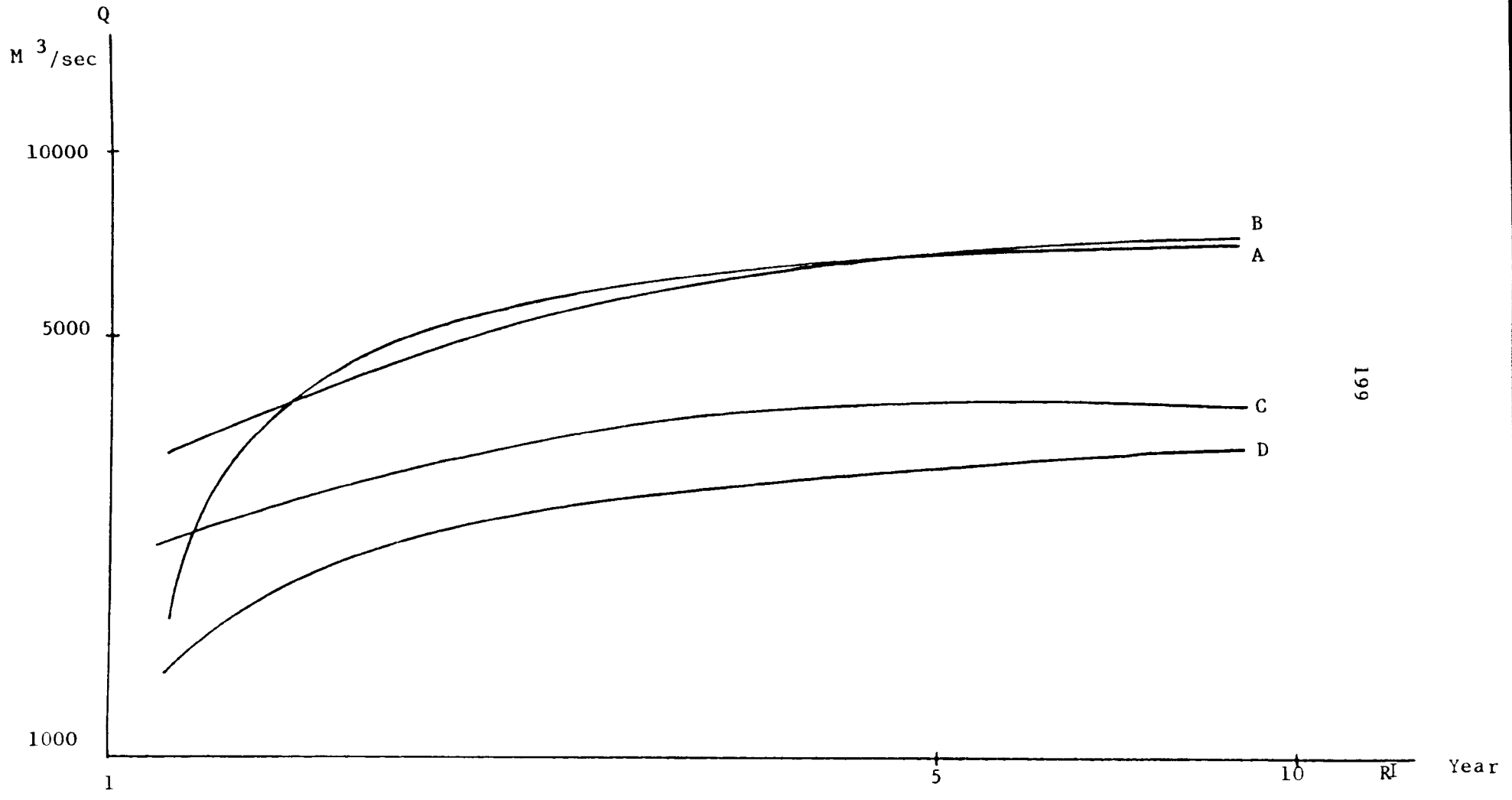
Euphrates, Tigris, and Tributaries Annual Flood Discharge Chances

River	Place	Percent change flood discharge M^3/sec.			
		50.	20.	5.	1.
Euphrates	Hit	2840	3740	4650	5500
Tigris	Mosul	3560	4900	6600	8400
Tigris	Baghdad	5230	7000	8950	10900
Great Zab	Eski Kelek	1970	2860	3900	5000
Lesser Zab	Qara Beg (Altun Kupri)	1440	2060	2780	3500
Diyalah	Jabal Hamrin	820	1120	1480	1820

N.B. (1) The annual flood discharge is the discharge corresponding to the highest routine daily gauge reading observed during the flood season. (2) In the case of Tigris at Baghdad the extreme floods must be regarded as potential only, since the embankments would not allow such discharges to pass through Baghdad itself.
(Source: (IONIDES, 1937, p.254).

Figure 6.2

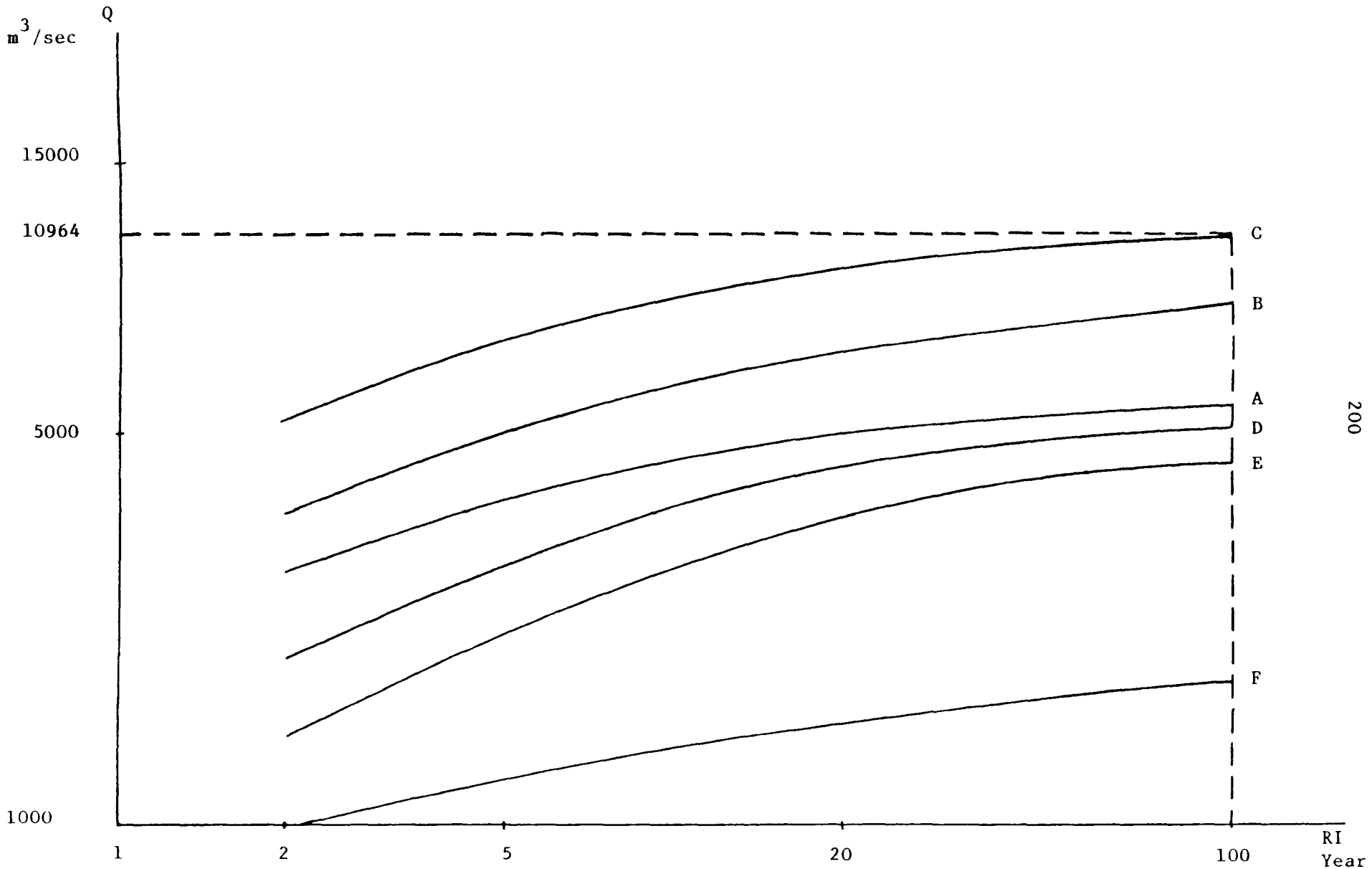
Annual Floods, Tigris and Euphrates Rivers, 1965-1972



A = Tigris River at Mosul city.
B = Euphrates River at Hit city.
C = Tigris River at Baghdad city.
D = Euphrates River at Hindiya city.

Figure 6.3

Euphrates, Tigris and Tributaries - Annual Flood Discharge Chances



A = Euphrates at Hit.
B = Tigris at Mosul.
C = Tigris at Baghdad.
D = Greater Zab at Eski Kelek.
E = Lesser Zab at Altun Kupri.
F = Diyalah at Jabal Hamrin.

From this it can be seen that there is a statistical probability of discharge as high as 10,964 M^3/sec. at Baghdad once every 100 years. Such is the nature of statistical probabilities, however, that such a discharge could, of course, occur in two successive years. Whether or not this will cause flooding will depend on the capacity of the channel to contain the whole of this flow; if it cannot, then flooding will occur. Whether or not this will lead to damage, in an insurance sense, will depend on what insured property stands on the flooded lands.

In many engineering situations, river works have to be carried out without a long record of river discharges being available. Since engineers frequently design up to the capacity of the 50 year flood, their estimates of what this will be are crucial to the safety of the work they carry out.

6.2.2 Alluvial Fans

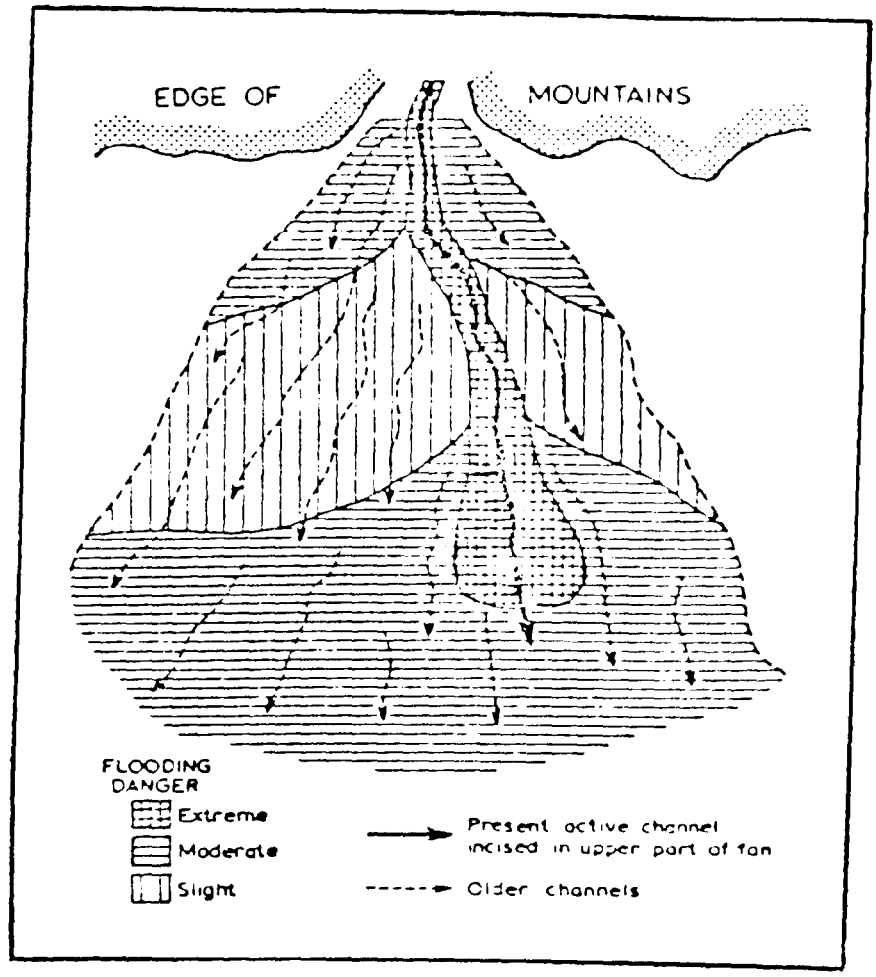
Alluvial fans are to be found in arid and semi-arid parts of the Arab world (e.g. Iraq, Saudi Arabia, Algeria, Egypt, Morocco etc.), and are the natural result of floods generated within mountainous zones emerging on to the plains where they deposit their high sediment loads as fans. They are most highly developed in areas of sparse vegetation and torrential rainfall. (A general model of flooding danger on fans is shown in Figure 6.4).

Flooding can be a serious problem on alluvial fans and can occur in two principal areas:

(a) along the margins of the main supply channel and

Figure 6.4

Relative Flooding Danger on a Typical Alluvial Fan in the Western United States.



(after Kesseli and Beaty, from Cooke & Doornkamp, 1978).

(b) in the depositional zones beyond the ends of the supply channels.

As the stream flow on fans is ephemeral, the probability of flooding is often ignored by man, but floods on fans can cause severe problems due to their high velocities, variable sediment concentrations, and their tendency to show swift alteration in flood location, so that channels can be abandoned and new ones created in relatively short periods of time (Cooke, et al, 1982).

In addition, deposition on fans arises from changes in the hydraulic geometry of flows as they leave the major feeder channels from the mountains. Here the flow increases in width, decreases in depth and velocity, and often loses water by infiltration into permeable alluvial deposits, thus causing deposition. Therefore, alluvial fan flooding is a menace to farmers working agricultural land on fans, to those concerned with building and maintaining lines of communication (e.g. roads) across them, and to residents in communities built on them (Cooke & Doornkamp, 1974, p.108-109, and Cooke et al, 1982, ch. VI).

Cooke and Doornkamp (1974) provide a case study of alluvial fan flooding in southern Jordan. This flood occurred on 10-11th March 1966 when torrential rain fell in the basin and precipitation of over 50mm was recorded in some places, with the highest rainfall occurring south west of Ma'an. The storm was possibly the second heaviest in the area for twenty years. Floods began in mountain tributaries and were fed into the main valley along alluvial fan channels. The flow accumulated an enormous amount of sediment which reached as far downstream as the southern Arava and the Gulf of Aqaba. Most of the damage occurred in the town of Ma'an where

some 70 people were killed and overe 250 were injured, and a large number of houses were destroyed, when an artificial dam was broken. Damage was estimated at between US.$ 1.3 and $ 3.7 millions

Another case study is described (Doornkamp, et al, 1978) for the flood hazard of the Suez City (Figure 6.5). Alluvial fan flooding extends into the area of proposed urban development and places it at risk.

6.2.3 Coastal Flooding

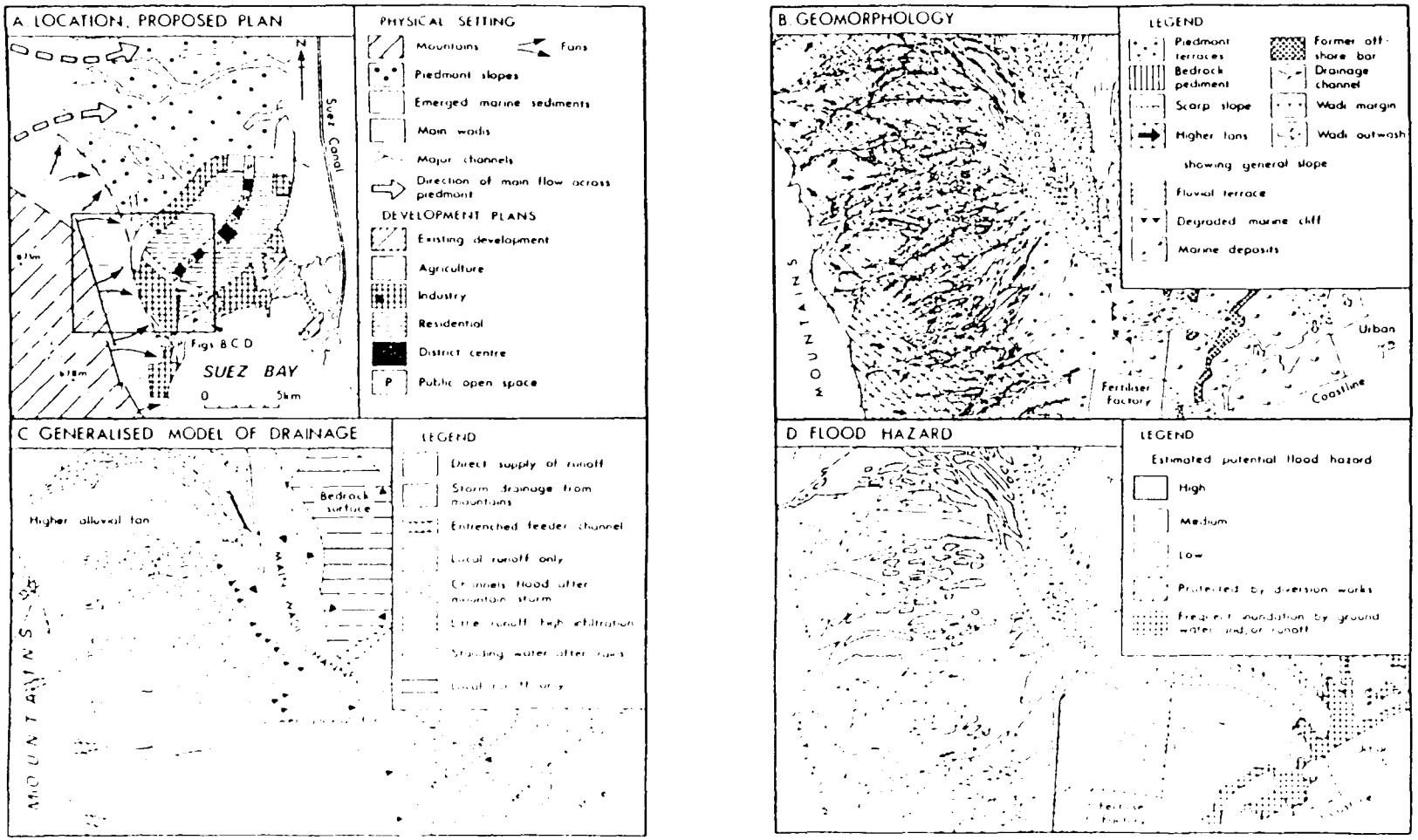
The factors which must be taken into account in relation to coastal flooding are: the state of the tide, wind speed, wind direction, the shape of the coast line, its exposure, its off-shore characteristics, and the steepness of the inland ground.

Coastlines are normally subjected to two high and two low tides each day, with the tidal range reaching a maximum at spring tides and decreasing to minimum at neap tides. The normal range of tidal behaviour does not result in catastrophic flooding, either because the coastal land surface is well above spring high tide level or because low lying coasts which are frequently covered by water are not inhabited by man (Ward, 1978, p.41).

Severe meteorological conditions, however, can cause extensive coastal flooding, especially when a strong on-shore wind coincides with a high tide. This water can cause considerable damage. Some countries are well known for their frequent and violent winds, others are more fortunate, enjoying a much calmer atmosphere, but even these (including the shores of Arab lands) can experience dramatic storms.

Figure 6.5

Geomorphological Assessment of the Potential Flood Hazard of the Site of the Suez Development Plan



In 1978 the Commercial Union Assurance published a study of coastal storm risks, which was concerned with high winds associated either with frontal depressions or tropical cyclones. The average number of days per annum with gales varied from less than 5 in many of Arab areas (e.g. Basra, Kuwait, Bahrain, Jidda, Beirut, Suez etc.), between 10-20 in Casablanca, Bizerta and Socotra, between 30-45 in Tripoli, and to 45 or more in Berbera and Tunis (see natural hazard data in the Appendix and Maps). For the purpose of that study, gale force represented force 8 or more (on the Beaufort Scale) as recorded at each location, and the velocity of these forces ranged from 39 to 46 miles per hour for force 8 to above 75 miles per hour for force 12. Such high winds are particularly significant if they blow on-shore.

Sudden storms with high waves may not be new in the Arabian Gulf, but the oil jetties and port installations are. These installations, built up along the Arabian coasts and particularly exposed to storms, have suffered much damage from sea waves, and one must expect serious losses from storms every year. Even fairly gentle winds can cause site-spills to drift towards the shore and cause damage, as has been shown in the Gulf during 1981.

6.2.4 Man-induced Floods

The catastrophic floods associated with the Machu dam disaster in Morvi - India in 1979 (killing 5000 people and destroying a whole settlement) has made the world aware of the potential risk below

any dam which bursts. In the Arab world this is especially important as an assessable risk in the earthquake zone. (see Section 6.3).

6.2.5 Flood and Insurance

6.2.5.1 Flood Losses

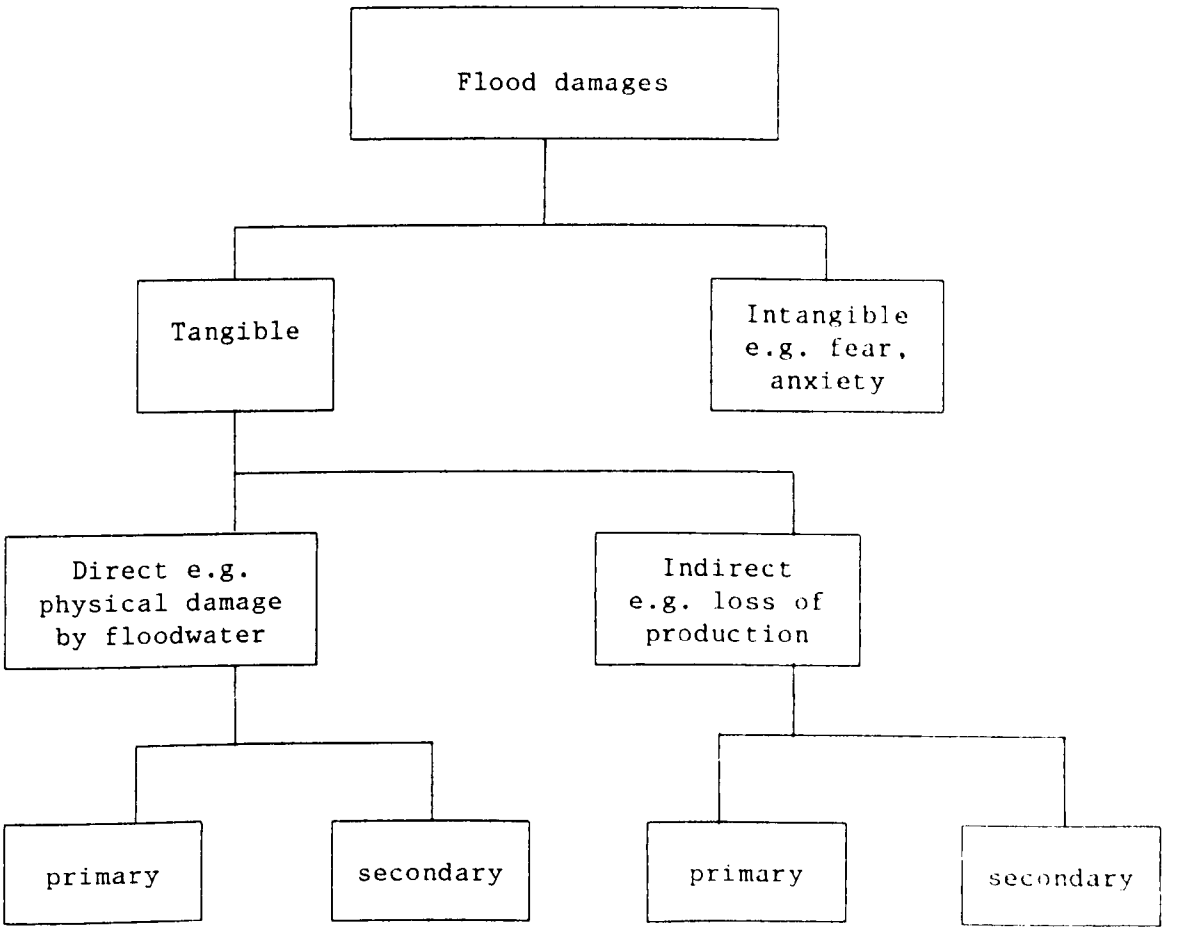
Flood causes considerable damage and in order to discuss the effect of flood on the insurance and reinsurance business, it is important to classify the flood damage into tangible and intangible damage, according to whether or not the damage can be expressed in monetary terms.

Intangible damages include fear, anxiety, annoyance, distress, insecurity and ill-health. In general such damages are uninsurable. Tangible damages can be divided into direct and indirect categories. Direct damages include physical damage to buildings and their contents, bridges, roads, railways and to agricultural land. These losses result from the physical contact of vulnerable property with flood water. Indirect damages include loss of production, loss of income and business, delays in transportation of goods and people. These losses result from the breakdown of specified economic activities. Finally direct and indirect damages need to be subdivided into primary and secondary categories (Ward, 1978, pp.173-5), and Figure 6.6 illustrates the types of flood damage which may occur. Munich Re (1973, p.4) has pointed out that, in general, damage caused by flood and inundation is deemed to be included in the framework of some classes of business, such as contractors' all risks,

erectionall risks, plate glass, livestock and motor. The influence of flood and inundation hazard in these classes of business does not constitute a great problem since it is in most cases onlya secondary element of the insurance protection granted and is not the decisive factor in the demand for insurance. This means the water risk has an important influence on demand for CAR/EAR covers. This argument may be true of CAR/EAR, but in the case of other classes of insurance, flood and inundation may cause a great problem to insurers.

Figure 6.6

Types of Flood Damages



Source: (Ward, 1978, p.174)

In the insurance of construction projects, the risk of water damage varies to a degree during the insurance period. In the CAR/EAR insurance branches, experience regarding the water risk still induces the insurers and reinsurers to be rather reserved. In road construction, for instance, approximately 90 per cent, in fill-dam construction 75 per cent, and in bridge construction 50 per cent of all damage is caused by water. (Munich Re, 1973, p.5). Heavy rainfall in Iraq, Saudi Arabia, Algeria, Tunisia and Libya resulted in insured losses to CAR and EAR projects in excess of US.$.15 million during the period of 1967-1969. The return period for heavy rains is less than once in 10 years in these areas (Swiss Re, 1976, p.36), but even this may be more frequent than is normally perceived.

On two occasions in early 1982 heavy rain caused floods in the Gulf area which swept away huge stretches of road and caused great damage in Jubail industrial city (Financial Times, 1983). Furthermore, storms and torrential rain reported in May 1981 in the U.A.E. and Oman resulted in one of the largest claims that insurers in the U.A.E. have had to meet; initial estimates put the cost of damage at DH 1000 (U$ 234) million. Thirty-five people were killed. Some of the U.A.E's smaller and undercapitalised insurers faced possible ruin because many of them had an insufficient financial base and reinsurance backing (Lloyd's List, 1981). Table 6.3 shows the major floods in the Arab world during the period 1972-1982.

Table 6.3

Recent Major Floods and Storms in the Arab World

Date	Place/ Country	Cause of Loss	Victims/Damages	Insured Loss
10 Feb.1972	Northern Yemen	Flooding	35 dead	n.a.
March 1973	Tunisia and Algeria	Flooding	Over 100 dead	n.a.
Mar. 1974	Algeria	Flooding	n.a.	n.a.
Aug. 1975	Northern Yemen	Flooding	At least 80 dead	n.a.
Sept. 1975	Banks of the Nile/Sudan	Flooding	75,000 homeless	n.a.
June 1977	Masirah/Oman	Hurricane	110 dead	n.a.
Jly. 1978	Gezirah/Sudan	Flooding	500.000 homeless	n.a.
Oct. 1979	Egypt	Flooding	At least 30 dead	n.a.
May 1981	Oman-UAE.	Storms	35 dead	n.a.
May 1981	Central of Somalia	Flooding	600,000 homeless	n.a.
Sept. 1981	El-Eulma/ Algeria	Flooding	43 dead	n.a.
Oct. 1981	Arabia Gulf	Storms	200 dead	n.a.
Jan. 1982	Arabian Peninsula	Heavy storms	over 30 dead	n.a.
Apr. 1982	Southern Yemen	Flooding	500 dead, over 10,000 homeless	n.a.
Nov. 1982	Tunisia	Rainfall flooding	100 dead	n.a.

Source: Swiss Re, Sigma, various issues of January.

6.2.5.2 Assessment of the Flood Risk and Losses

5.2.5.2.1 Assessment of the Flood Risk

Many of the Arab countries are considered arid and semi-arid regions. Consequently when a construction project in an arid region

is to be insured, underwriters are mostly advised that the flood and inundation hazard is extremely low and that in this respect, the risk can be considered a good one. However, popular belief and experience over short periods are not sufficient evidence.(1)

As far as river flooding is concerned it has been shown above (as well as by the Swiss Re, 1976), that even short records of river discharge can be used to estimate the risk properly. However, observations in data sets and at particular sites can occur. Other techniques for predicting flooding are available - e.g. based on drainage basin characteristics. (See Cooke et al, 1982).

If river records are available for a long period of time, then it is relatively easy to assess the flood risk to which a location is exposed : periods of 50 years and 100 years may be considered as good and very good respectively. If no water-level data taken near the site are available, assessment may also be effected on the strength of flow values determined at gauging points above the construction site (Munich Re, 1973, p.10), or by the geomorphology of the site itself (Cooke et al, 1982).

Finally, in order to determine an adequate risk assessment, the underwriter needs to know two factors: first, the probability of a loss occurring, and secondly the extent of the damage resulting from such an event. When these factors have been ascertained, premium, deductible and limit of indemnity can be produced.

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(1) As an example, a contractor was told by villagers near one isolated site that there had been no rainfall over the previous four years. During the next eighteen months, flood and storm losses occurred at that site on seven occasions (Seaton, 1977 p.2).

6.2.5.2.2 Assessment of Flood Losses

To assess the extent of any loss, it is first essential to examine all the details of the project. There is no doubt that statistics on losses are very important for determining the loss potential, but in arid lands flood losses may not be adequately documented, and in any event are irrelevant when construction is taking place on land that is subject to a greater flood risk than has historically been the case if the construction work itself changes the risk factors.

The most indispensable items of information needed are (Swiss Re, 1976, p.23):

(a) Relevant plans and drawings. It does not follow that the volume of plans and drawings decides the quality of the formation, and the underwriter may need to obtain advice on how effectively flooding can really be predicted from the studies already carried out. In this respect, an evaluation using principles of geomorphology is valuable.

(b) Work progress schedule. A work progress schedule is essential to find out the severity of loss and is, therefore, the key to assessment and underwriting.

(c) Bill of quantities with detailed prices. The bill of quantity, with the unit prices, will supply the basis for calculating the expected damage.

However, these only relate to the project. They are inadequate

for the purposes of assessing the actual physical risks at that site. What is more, the construction work that is being, or has been, undertaken may itself increase the risk of flooding (e.g. when a critical wadi has been inadvertently blocked). This may require very careful investigations.

6.3 Earthquake

6.3.1 Historical Evaluation

The Arab world has a continous history of disastrous earthquakes; in 551AD for example, Beirut was destroyed by an earthquake with an estimated magnitude of 7.5 Richter scale. The history of serious earthquakes includes the destruction of the city of Antioch in Syria, which claimed 250,000 human lives as early as 859 AD (Swiss Re, 1980, p.3). The earthquake extended to Ragga, Harran, Ras El Ain, Hims, Urfa, Damascus, Turtus, Misis and Adina. From such accounts one is tempted to assign a magnitude of M.8 to 8.5 to this event. (Swiss Re, 1978, p.32).

In more recent years earthquakes include that of 10th October 1980, which destroyed El-Asnam in Algeria. More recently an earthquake occurred on 13th December 1982, when more than 3000 people were killed and 400,000 left homeless in North Yemen, an area which does not normally suffer from earthquakes. Table 6.4 lists some of the major earthquakes which have taken place in Arab countries since 551 AD.

Table 6.4

The History of Major Earthquakes in the Arab States

Year (A.D)	Place/Country	No. of victims/damages
551	Beirut - Lebanon	Heavy damage, M. 7.5
847	Antioch - Syria	20,000 dead and heavy damage
847	Mosul - Iraq	50,000 dead and heavy damage
849	Baghdad - Iraq	Damaging
859	Antioch - Syria	250,000 dead (M.8 - 8.5)
860	Baghdad - Iraq	Damaging
881	Baghdad to Basrah - Iraq	Soil liquefaction
902	Baghdad to Basrah - Iraq	Soil liquefaction
977	Baghdad - Iraq	Damaging
986	Mosul - Iraq	Many people dead.
1031	Mosul - Iraq	50 houses destroyed
1058	Mosul - Iraq	Many people dead.
1071	Baghdad - Iraq	Damaging
1118	Baghdad - Iraq	Damaging
1130	Baghdad - Iraq	Very damaging
1149	Baghdad - Iraq	A great earthquake
1201	Coast of Syria	Heavy damaging (M.7.5-8)
1227	Mosul - Iraq	-
1262	Mosul - Iraq	-
1436	Mosul - Iraq	-
1503	Mosul - Iraq	-
1550	Mosul - Iraq	-
1717	Algiers - Algeria	20,000 dead
1751	Agadir - Morocco	Damaging
1754	Cairo - Egypt	Damaging
1790	Oran - Algeria	Damaging
1790	Oran - Algeria	Destroyed
1822	Aleppo - Syria	20,000 dead
1867	Blida - Algeria	-
1837	Lebanon	-
1864	Baghdad - Iraq	Damaging
1867	Blida - Algeria	-
1885	Central Atlas - Algeria	-
1927	Jordan Valley	-
1954	Alexandria - Egypt	(M.5.5)
1954	El-Asnam - Algeria	1200 dead, 20,000 homeless. Damages estimated at US$ 150 m.
1955	Alexandria - Egypt	22 dead, (M. 6.7).
1956	Lebanon	136 dead, (M.6) with heavy damage
1956	Dead Sea - Jordan	-
1959	Oran and Saint Cloud - Algeria	(M.5.3)
1960	Agadir - Morocco	15,000 dead, damages assessed at US$ 120m (M. 5.8)
1969	Cairo, Sinai, Asyut - Egypt	Damaging (M.7)
1974	North Libya	(M. 5.6)
1979	Baghdad - Iraq	No damaging, (M. 4.5)
1980	El-Asnam - Algeria	20,000 dead, 250,000 homeless. Damages estimated at US$ 3000 m.
1982	Northern Yemen	Over 3,000 dead, 400,000 homeless.

Source: (1) Swiss Re, Atlas on Seismicity and Volcanism, 1978, pp.31-32.

(2) Swiss Re, Sigma, Nos. 1 of 1981 and 1983.

6.4.2 Location and Types of Earthquake

Most of the earthquakes in the world have happened at the following locations (Swiss Re, 1977, p. 9):

(a) about 80 percent of all earthquakes are observed in the circum-Pacific belt which follows the West coast of South America, Central America, the arc of islands in the northern part of the Pacific, Japan, Taiwan, the Philippines and a section of Indonesia.

(b) About 17 percent of earthquakes are observed in a belt which extends from the Azores in the Atlantic to the southern part of Europe and part of North Africa, Turkey, the Near East including Iran, part of Arabia, Afghanistan, Pakistan, India and Burma. A more detailed picture of the earthquake risk in the Middle East and North Africa is given in the Natural Hazards maps. (see Appendix).

The probability of earthquakes varies greatly within these belts. Although earthquakes are more common there than elsewhere, it does not mean that places outside the known earthquake zones are entirely without earthquakes. However, within those belts, earthquakes may strike at almost any place and at any time.

The coastal areas bordering the Red Sea and the Arabian Gulf are considered to be in low exposure zones (see Natural Hazards Maps) although some earthquakes of a lesser magnitude have occurred in the past. However, the 1982 earthquake in North Yemen shows that the degree of exposure in the area may be higher than previously thought.

Furthermore, due to the high concentration of industrial complexes in the coastal areas, it is here that the Arab world may expect the biggest ever single loss from earthquakes in the future (see towns and development projects maps).

Earthquakes can also occur within geologically stable areas, for instance, one occurred at Meckering in Western Australia in 1968, and there have been other examples from time to time (Verney, 1979, p.74). Stable regions might also be affected by a strong earthquake in neighbouring areas. The consequences of such are difficult, if not impossible, to predict.

Earthquakes are caused by volcanic activity and by tectonic movements in the crust of the earth. Volcanic quakes do not normally release a large amount of energy and are not very important for the insurance world. (Munich Re, 1973, p.7). The relative movement of continental or submarine plates against each other create much greater stresses. These stresses become obvious on the surface in the form of faults, and they can generate frequent large earthquakes, such as along the famous San Andreas fault in South California, (Doerr, 1973, pp. 1 - 2).

From the above, it can be seen that earthquakes are possible everywhere; however, it is possible to produce earthquake risk zones, in map form, as a basis for insurance/reinsurance assessment. The only real differences betwen the belts of higher earthquake intensity and the areas beyond them is the return period of earthquakes of high intensity.

6.3.3 Return Period

The average time which elapses between two unrelated earth-

quakes of the same magnitude (M) in the same location is called the 'return period'. The study of return periods, or the frequency of earthquakes, in a particular area is essential to insurers or reinsurers in assisting them to estimate the relative earthquake risk of various areas and the maximum possible losses. However, since there is only a short period of scientific experience available for calculating the return periods of earthquakes other than for China, prediction is difficult. The analysis of earthquakes shows that some places are more at risk than others (see Swiss Re, 1977), even though the precise timing of such events is imposssible.

To take the Morocco region for example, an earthquake occurred at Agadir in 1751 but there was no recurrence until 1960 (M.5.9). The interval between them was over 200 years. However, it does not mean another 200 years must elapse before another earthquake occurs; such a prediction could be very wrong, and that the site remains vulnerable is beyond doubt.

Wakuri and Yasukara in their paper, Earthquake Insurance in Japan, (The ASTIN Bulletin, Vol. IX, Part 3, 1977, pp. 334-5), say, concerning the return period:

> "Large earthquakes are always followed by aftershocks. For a period of several years after a large earthquake, say possibly 20 to 30 years, there occur a number of earthquakes and these are considered to be aftershocks ..... It appears that no earthquakes, even small ones, occur during the 20 to 30 years preceding the next large earthquake".

However, exceptions do occur. If the earthquakes of El-Asnam in 1954 (M.6.7) and in 1980 (M.7.3) are taken into consideration, it can be seen that they do not conform to this hypothesis

in two important respects. Firstly, the two major earthquakes occurred with a short return period of 26 years, whereas for a major earthquake this is normally once in about 100 years (such as at San Francisco) or even once in 200 years (as at Lisbon). Secondly, the earthquake of 1954 was followed by a larger one in 1980.

Furthermore, although past losses and seismological records show that, on average, an earthquake of magnitude 7 may be expected to occur once every fifty years (Perry, 1977, p.10), the statistics also show that an earthquake of M.7 in one territory produces a different return period from one of the same magnitude in another territory. For example, a return period of 102 years was calculated for earthquakes in California with a magnitude of 8 on the open-ended Richter Scale, while the figure was 16 years for earthquakes of the same magnitude in the Philippines (Oberschelp, 1977, p.13). Therefore knowledge of the return periods of an earthquake in a particular territory is essential to rating the catastrophe excess of loss covers.

6.3.4 Assessment of Earthquake Risk

It is becoming of increasing importance that insurers have accurate information about the location of earthquakes and their return periods because in recent years there has been an increase in both earthquake activity in the number and size of insurable structures placed in risk zones.

Generally speaking, in evaluating earthquake risks, whether for residential, administrative or other purposes or whether forming

part of a factory or an industrial complex, the most essential factors to be taken into account are (Swiss Re, 1977, pp. 9-27):-

1. Position with respect to hazard exposure (i.e. geographical position with respect to the earthquake belts or hazard zones).
2. Magnitude of the earthquake as measured on the Richter Scale. In contrast the intensity of an earthquake is a qualitative measure of the effect at any particular point and is recorded on the modified Mercalli Scale. A greater magnitude usually means a higher degree of damage, death and destruction, but this is not always the case, as a shallow shock can be felt over a comparatively small area and cause much destruction, while a deeper shock may occasion only moderate shaking over a much greater area and do little damage.
3. Subsoil conditions in earthquake areas. The ground on which a building stands has a considerable effect upon its behaviour during an earthquake. It is certainly a sound practice to build on a rock foundation, and to avoid building different parts of the structure on ground of varying soil or rock densities. Buildings standing partly on rock and partly on fill are particularly vulnerable (Eiby, 1967, p. 162). However, it is important to get information on the type of subsoil in the region of the risk, on depth of layers if the subsoil is soft (e.g. alluvium) and on the ground water level. As a general rule, it can be taken that the harder a material on which a building is founded, the smaller the damage will be. Ground water raises the level of damage. Therefore, careful consideration of the subsoil conditions is of great

importance to the stability of a structure.

4. Building material. The quality of the material is also important in affecting the level of damage. If for instance, bricks or stones are set with mud or even lime mortar, the stone or burned brick will hold, but the mortar will fail. Cement mortar performs far better than lime mortar; this means that it is wrong to construct a perfectly designed building of second-class material (Munich Re, 1973, p. 13). In Agadir the old stone masonry was held together with a mortar of mud and sand, and roofed with anything from timber and corrugated iron to reinforced concrete slabs - this led to heavy damage (Eiby, 1967, p.176).

5. Building design. If a building is irregular in its outer shape (such as L or U shaped building), or in its structure, increased damage will occur, due to complicated and difficult to determine oscillation patterns.

6. Quality of design. Obviously, great expertise is required in the design of structures, to make them as secure against earthquake forces as possible. There are agencies which are highly experienced in this field (e.g. in Japan and the U.S.A.) and it is important to utilize such expertise.

7. Sensitivity. In the case of machinery or industrial plant, a further factor should be considered, namely, sensitivity. Machinery or similar items are not only exposed to risks by falling debris, but by tilting or cracking foundations too. A generally rather insensitive item could sustain heavy damage if it were installed in a building where total or part-

ial collapse might bury it under heavy debris, or if its foundations were laid on bad subsoil.

Finally, there is the possibility that fires resulting from earthquakes may cause more loss and damage than the original shock (as in the case of the earthquakes which hit San Francisco in 1906 and Tokio in 1923).

Even when the above factors have been taken into consideration in assessing the earthquake risk for individual builings, there still remains a major problem for insurers and reinsurers, i.e. that of assessing the probable total loss resulting from an earthquake catastrophe. Therefore, it is important to divide earthquake areas into zones of accumulation of earthquake risk. After the accumulation zones have been determined, it is essential that direct insurers have at their disposal a system which will enable them to ascertain at any time their commitments in terms of total sums insured in various zones of accumulation. (Munich Re, 1973, p.13).

It is also necessary for an insurer to determine his commitments in terms of sums insured in the various zones of accumulation, but this matter is more complicated for a reinsurer, as the reinsurer has to work through several insurers in various countries, and is therefore dealing with accumulation commitments in a number of connections, and not only for the earthquake risk covered under fire and fire loss of profits. Thus both the insurer and reinsurer must expect an accumulation from CAR, EAR, marine cargo insurance, motor hull insurance as well as life insurance and personal accident insurance (Ibid). In such cases portfolio risk consists of two factors (Carter, 1979, p.331):-

1. The expected loss per structure.

2. The probability of many losses resulting from the same event.

Friedman (1984, p.63) has pointed out that in the case of property insurance portfolios covering natural perils, past loss experience is unlikely to provide an adequate guide to an insurer's future risk for the natural hazards because,

(i) property characteristics do not remain constant;

(ii) number, type, and geographical distribution change rapidly with time; and

(iii) their susceptibility to damage also changes, due to the changes over time in building design, material and construction, building codes, and insurance coverage.

To provide a measure for evaluating the magnitude of the future natural hazard damage potential, Friedman suggests two alternative approaches: either quantatively or qualitatively estimated in an insurance operation. Both measures can be tested using natural hazard simulation. (1)

6.3.5 Earthquake Protection

It is still not possible, despite much scientific work, to predict both the place and time of an earthquake. Therefore, protection against earthquake damage is essential within the vulnerable

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(1) For more information about the subject see Friedman (1972) and (1984).

seismic zones. The most obvious danger areas must be avoided, and any building in earthquake-prone areas must be made as safe as possible by sound construction methods (1)

Because earthquakes can bring about the comprehensive devastation of an area, government intervention is important and it must focus on risk prevention and on determined effort to get better information, such as, detailed intensity, return period, maps of exposed cities, and exposure data by types of structures over the same urban areas.

The action of government is principally along two lines:

(i) legislation and administration,

(ii) planning for loss reduction.

Earthquake damages could be substantially diminished by enforcement of improved building codes to ensure better earthquake - resistant design. Most loss of life in earthquakes is due to a fall, or partial fall, of buildings. However, any co-operation between geologists and engineering staffs can go toward preventing dangerous locations of structures. (Oakeshott, 1976, p.112)(2)

It is significant that evidence exists to show that dams over 100 m. high and sited on weak lineaments in the earth's crust can generate earthquake activity. Here the prediction of an earthquake depends on an adequate amount of information concerning the dam and reservoir site. In general, the insurers and reinsurers must turn to the professional earth-scientist for advice.

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(1) The traditional Japanese view says that earthquake resistance construction substantially adds to building costs and even then cannot withstand the severest of shocks. Therefore why not build in a form that can easily and cheaply be replaced but which does not pose high risk to human life.

(2) In some cases there are no safe sites, so it is impossible to avoid areas of risk. As an example, the land area of Iran and Turkey are within the earthquake prone zone, therefore the whole of each country is exposed to some measure of risk.

6.4 Salt Weathering

The ambitious construction programmes in many Arab states in recent years have been accompanied by very grave salt weathering problems. The use of concrete and natural stone for buildings, structures and roads in the presence of salts has resulted in much damage. The review in this section is based on the study by Cooke, et al, 1982, 'Urban geomorphology in dry land'.

6.4.1 Salt Weathering Processes

Rock disintegration by salt may result from either physical or chemical changes (Figure 6.7). Physical weathering arises from stresses created by the expansion or growth of salt in confined spaces, particularly pores. Such a process is probably due to three main pressures:

(a) the saline solution is exposed to evaporation in high air temperatures which results in the growth of salt crystals in confined spaces,

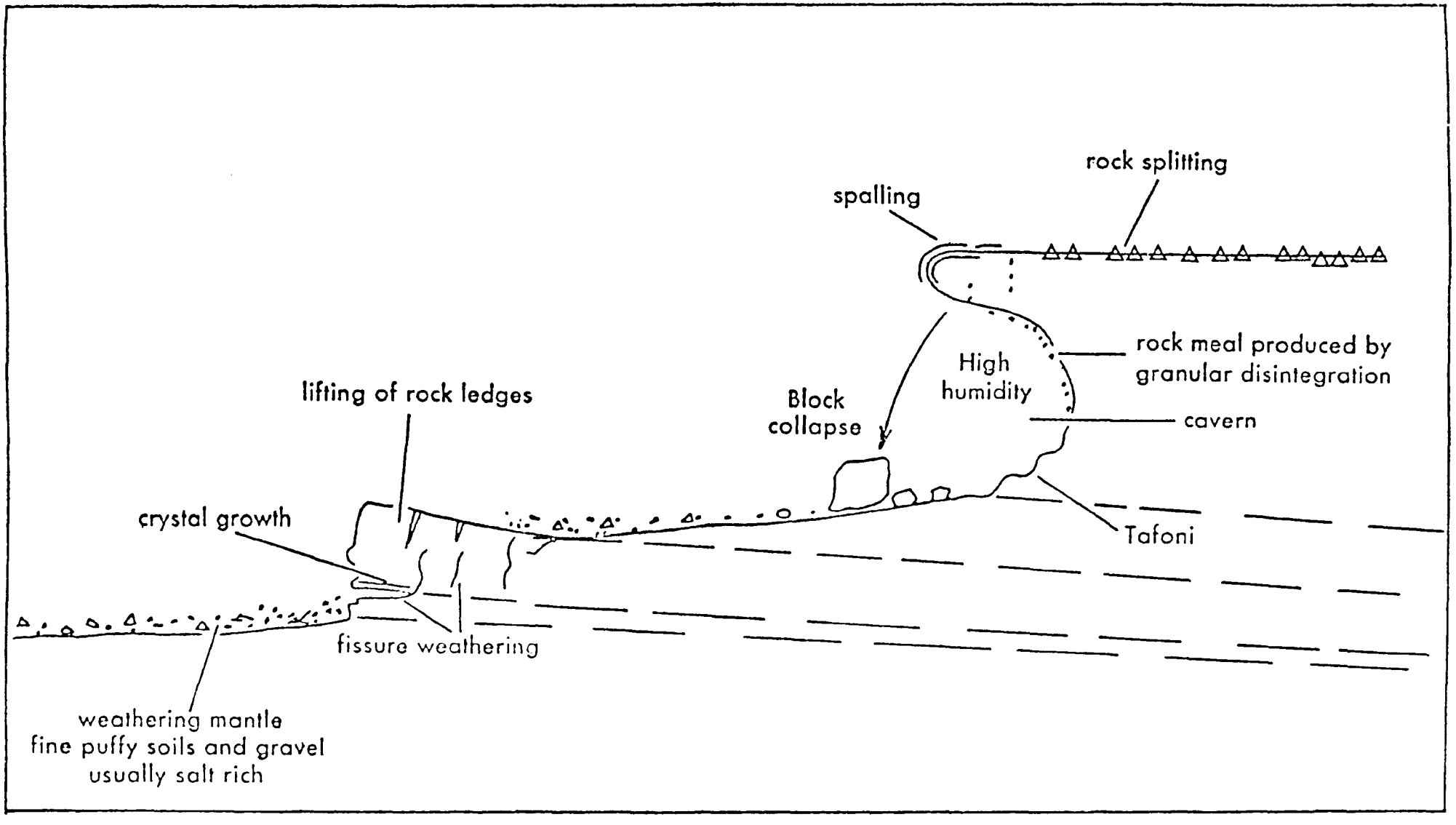
(b) hydration can occur, whereby salt molecules combine with water molecules to form salt crystals, where the water may be derived from the atmosphere, and

(c) thermal expansion of salt crystals takes place during the day time.

When the salt crystals have a higher coefficient of thermal expansion than the surrounding concrete they cause physical stress leading to disintegration.

Figure 6.7

Effects of Salt Weathering Noted in Bahrain



Source: (Cooke, et al, 1982, p.141).

Chemical processes of salt weathering may also result in volume changes which cause disintegration particularly in association with concrete . For instance, chemical exchange between sulphate (SO_4^{-2}) in solution and calcium aluminium hydrate in cement produce reactive products of larger volume. Equally cement and gypsum react, producing expansive Portlandite (calcium hydroxide).

6.4.2 Damages due to Salt Weathering

6.4.2.1 General Prospect

Cracking, spalling and granular distintegration are the usual signs of salt weathering attack, and some of these damages have been reported in many Arab states. However, the most serious causes of damage due to the activity of salts include:

1. The reduction in the strength and durability of the materials used in construction (e.g. concrete, steel) resulting from the alteration of their chemical composition. In the case of steel, chlorides in the concrete can cause the corrosion of steel reinforcing bars, which in turn leads to an increase in its volume which then exerts pressure on the surrounding concrete and results in its disintegration (e.g. as occurred in the nurses home attached to the hospital in Manamah, Bahrain; this building had to be demolished.
2. Salt and saline solutions (especially chlorides and sulphates) in buildings and other structures may cause weakening and disintegration due to volumetric changes caused by the process-

es of salt weathering (e.g. as in selected government flats in Bahrain).

3. Serious damages may occur due to ground movement caused by changes in the volume of salts existing in foundation fills. For example, gypsum may cause an increase in void space and subsequent surface subsidence, while hydration can lead to volumetric expansion and result in ground heave (e.g. also a problem at the same Nurses Home, Manamah, Bahrain).

The existence of salts in buildings, structures and roads, may be derived from one or more of the following sources:-

- salts contained in materials prior to their use in construction;
- the chemical alteration of the original material may result in formation of salts;
- salts can be produced from outside sources, such as, the environment (especially near the coast), and inundation of buildings with saline water from piped water-supplies.

6.4.2.2 Buildings Made of Stone and Brick

Sandstone and limestone blocks bonded by cement or mortar may be subjected to salt attack. A survey (by Doornkamp et al) of the old town of Suez - Egypt, revealed different examples of building deterioration through salt attack, the most common kinds of damage being:

a. Groundheave of tiles and floor blocks, both inside and outside buildings, to a height of 150 mm, due to sulphate attack from underlying gypsum-rich desert fill.

b. Crumbling and disintegration of the surface of bricks, and sandstone or limestone blocks up to 1.0 m. above ground level, as a result of salt impregnation by the evaporation of groundwater that had risen within the building structure to the natural level of its capillary fringe (see figure 6.8).

c. Once cement and/or mortar has weathered out of place, the cavities left behind make possible the more intensive weathering of the exposed units of building stone.

6.4.2.3 Building and Structures made of Concrete.

Concrete buildings and structures are the most vulnerable of all buildings to the effect of salt weathering, and serious damage occurs which either requires expensive repair, or seriously reduces the life of the building. Such damage is the result of the causes identified in section (6.4.2.2) above. Seen on a wider scale the cracking of concrete in drylands is a consequence of a combination of factors, which include;

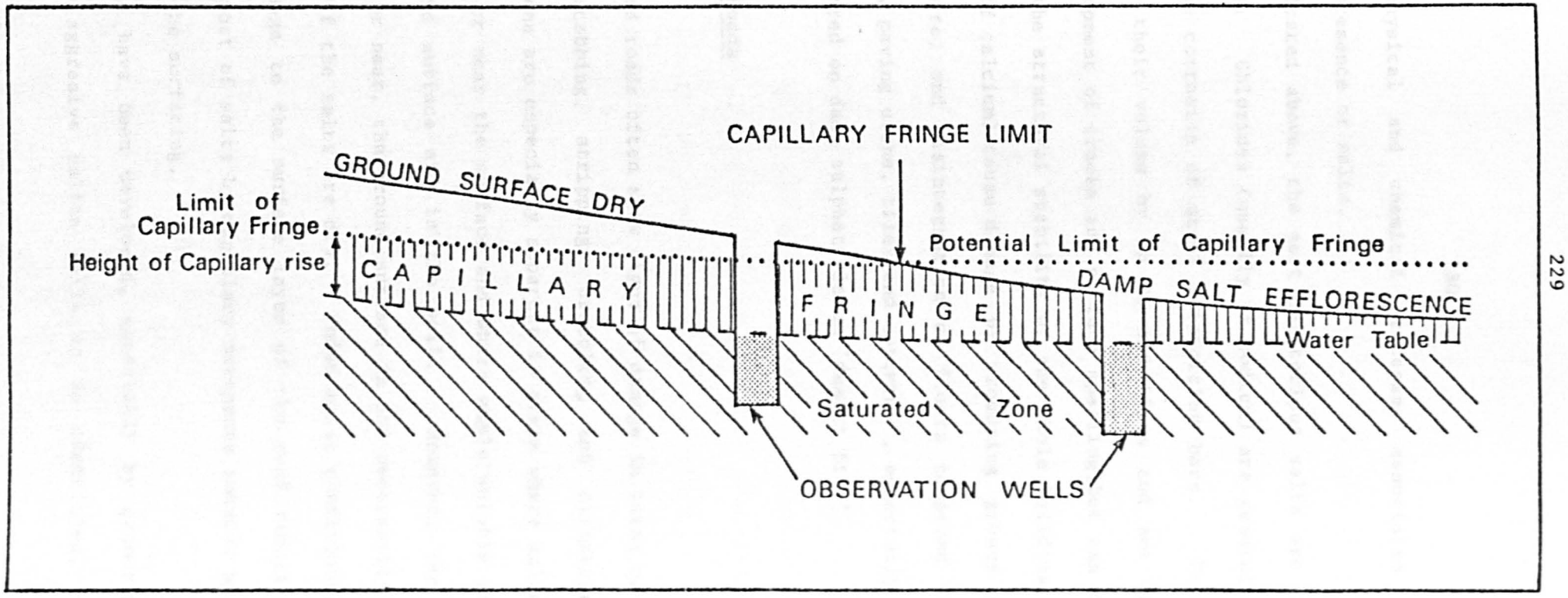
(i) climate (high temperatures, high evaporation rates, and low relative humidity),

(ii) faulty construction methods and design,

(iii) use of inappropriate aggregates, as well as

Figure 6.8

Definitions of Ground Water Terminology



Source: (Cooke, et al, 1982, p. 169).

(iv) physical and chemical processes associated with the presence of salts.

As indicated above, the most deleterious salts are chlorides, and sulphates. Chlorides (usually of sodium) are generally responsible for the corrosion of steel reinforcing bars. This process can increase their volume by up to six times and not only leads to the development of cracks and surface spalling,but can fundamentally affect the structural stability of the whole building. Sulphates(usually of calcium) cause damage by producing ground heave (of 150 mm or more) and disintegration of floors composed of bricks, stone blocks, paving stone, tiles and concrete , especially in buildings constructed on damp sulphate-laden 'desert fill'.

6.4.2.4 Roads

Surfaced roads often show signs of damage in terms of cracking, potholing, scabbing, stripping, crumbling and disintegration. These phenomena are especially apparent in areas where saline groundwater is at or near the surface and where ample soluble salts occur on the ground surface and in the soil. However, the existence of salts at or near, the ground surface is not necessarily an engineering risk if the salts are dry. Under moist conditions, however, physical damage to the surface layer of the road results from the upward transport of salts by capillary movements induced by evaporation through the surfacing.

Methods have been developed, especially by geomorphologists, which allow aggresive saline soils to be identified, mapped and

hazard zoning to be carried out. These are not described here, but may be found, for example, in Cooke 1982.

6.4.3. Insurance Application

6.4.3.1 Present Situation

From the previous discussion, it can be seen that salt weathering may cause severe damage to buildings, structures and roads, and this is all the more serious in view of the enormous building programmes adopted by the Arab countries, especially after the increase of oil prices in 1973. During that time serious damage has occurred to various projects, and some Arab governments (e.g. Algeria, Iraq, Egypt and Saudi Arabia) have reacted by requiring contractors to be responsible for all damages up to ten years after construction (decennial liability)[1] Therefore, all contractors must have a liability insurance policy to cover their liabilities against any damage that might happen during that period. In Algeria the contractors have no problem in obtaining such a policy; in Egypt, the law requires that contractors should have an insurance policy providing cover for such liability, which applies to all construction operations with a value of E.£.10,000 or more, and a construction licence will not be granted unless the insurance policy is submitted.

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(1) In France, decennial liability has long been an accepted part of their Civil code. Similar types of insurance are met in Belgium, Switzerland, Luxembourg and Holland. This type of insurance also applies in the developing countries including the Middle East (Piper, 1973-84, p.9.1-12).

In Iraq, although the contractors are also liable, by law, for damage to the structure for a period of ten years from completion, the Iraqi insurance market is not yet in a position to provide covers for these risks. It seems quite sensible that to service a contractors' requirements where this law applies it is necessary for the market to be in a position to furnish such covers. However, times are changing and the market must be prepared to provide coverage of this nature. Finally, in Saudi Arabia it is becoming common for a clause to be incorporated into construction contracts. Contractors are free to seek insurance cover either from the local or foreign insurers.

6.4.3.2 Minimizing the Salt Weathering Risk

If the damage arising from salt weathering hazard is taken into account, both the contractors and insurance companies are potentially faced with large losses as the effects of this process takes hold on buildings and other structures. Greater efforts are now made by the construction industry in:

1. Avoiding hazardous ground, such as low-lying, damp, saline areas.
2. Designing buildings, structures and roads to withstand salt weathering attack.
3. Insisting on greater quality control of materials used in construction (physically and chemically).

However, many buildings were erected before this new awareness had any effect; these are at risk. Some contractors, even some

design consultants, are still proceeding without taking proper account of this hazard, and some new buildings are therefore also at risk. In view of this, and where major structures are involved, it would be prudent for insurers to have a site assessment carried out by a competent authority.

6.5 Sand Movement and Dust Storms

Large areas of most Arab countries are occupied by desert, some of it being sand desert, such as the Rub-Al-Khali, Greater Nafud, and Al Hasa, whilst North Africa includes the enormous Sahara desert. The movement of sand and dust by wind within and from these deserts is becoming an important problem, especially as development is leading to the spread of urban and industrial buildings, agricultural land, oil and gas pipelines, new roads, airports, telecommunication, and heavy industrial plants. Therefore, there is a need to understand this process and to assess its significance for the insurance industry. This section is also based on the work by Cooke, et al., 1982.

6.5.1 Damages of Sand and Dust Movement

Damage from sand and dust movement arises from one of three basic aeolian processes:

1. Deflation damage. Deflation, the removal of sand and dust by wind from desert surfaces, leads to the exhaustion of some of the essential soil constituents. Other effects include

scour and undermining of footing to telegraph poles, scouring beneath pipelines, railway sleepers and even roads, all of these effects can lead to collapse of the structures. Agricultural land and construction in the urban areas are also exposed to damages.

2. Damage from transported sand. The abrasion of structures and equipment is a direct result of sand storms in urban areas; sand abrasion causes great damage to building materials, telegraph poles and fences, glass loses its transparency, even car windscreens may suffer. For example, as a result of a storm (in the U.S.A.) on 27th December 1973, a single insurance company in California had 1200 claims for wind damage to windscreens and bodywork totalling US.$.165,000.

   Dust storms also cause different kinds of damage, but the problem that has received most attention is that of visibility reduction, a problem of extreme importance to the transport industry (see Dust haze at Bahrain, Houseman, 1961). Flights into and out of airports affected by blowing dust may be delayed, in places there may be a danger of runway skidding as at Sharjah - U.A.E.

3. Damage resulting from sand accumulation. Problems associated with dust deposition within drylands include the burial and killing of young plants, the rendering of roads impassable, and infiltration of dust into buildings creating problems of sanitation and housekeeping. While the problems associated with sand deposition include their effect on roads, railways, runways, pipelines, agricultural land and buildings; in many

places the consequences of sand encroachment is deterioration of communication, diminishing of land use, land abandonment, large loss to the industries and depopulation. Most of these factors have occurred, for example, in the town of In Salah in the Algerian Sahara.

Industrial plants are vulnerable to sand movement and can sustain considerable damage from heavy winds. In particular, plant may be at risk if sand or silt particles enter machinery or sterilized buildings. Communication lines are also susceptible to sand storms, and roads can be covered by the movement of dunes. Some roads and railroads may be designed to be self-clearing, but others, especially where they cross active sand fields, may be continuously in danger, as for instance, the road from Kharga to Asyuit in Egypt, and the new road from Al Ain to Abu Dhabi (U.A.E.) Pipelines may be buried by sand, especially in the areas of active dunes, making it difficult to carry out maintenance or inspection, and possibly causing fracture. For example, Berz (1984, p.139), has pointed out that in North Africa, throughout the construction of a gas pipeline, a large excavation was filled up by flying sand and drifting excavated material as the result of a sandstorm. The costs of re-excavation involved here were approximately US$350,000.(1) Many other instances of sandstorms in the Arab world have given insurers problems in the past; for example, serious damage was caused to various items of contractors' equipment due to the contractors having used the incorrect filters on the engines (Roberts, 1977, pp. 2-3).

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(1) "As it turned out during the subsequent meteorological investigation, wind forces of 5 or more, causing sand drifts or sand storms, could be expected in this area on an average of 35-50 days a year" (Berz, 1984, p.139).

Sand and dust movement occurs in all of the Arab states, but the problems are most serious in areas of active dunes, strong winds and surface instability. The major source areas are those of North Africa, Northeast Sudan and the Arabian Gulf [1] (see Natural Hazards Maps).

6.5.2 Insurance Cover and Control Measures

If all the above risks are taken into account, it can be seen that the impact of sand movement and dust storms on different economic activities in the Arab region is going to become more important than it has been in the past. However, from the insurance point of view, the Arab insurance market has had little experience of this kind of insurance. Recently, however, there have been a few endorsements as extensions to original fire and CAR/EAR policies to cover damages derived from these perils.

Effective control measures depend largely on adequate appraisal of the problem. However, a sound general rule in environmental management is to avoid hazard areas as far as possible. The best means of avoidance lies in reasonable site selection, which is a specialist skill requiring knowledge of the terrain and the physical processes governing sand and dust movement. Where the problem cannot be completely avoided, the site may be designed so as to minimise the impact of aeolian problems. Al Ain, in U.A.E., for instance,

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(1) Saudi Arabia is in a known sandstorm area. According to the meteorological reports, there is a possibility of sandstorms causing serious damage to property in many areas of Saudi Arabia, particularly those containing industrial complexes.

had to be located for political and water supply reasons near to the old Oasis, but the new city plan attempts to take account of the possibility of serious sand storm damage associated with the nearby, great and active sand dune fields.

It should be pointed out that the effectiveness of stabilisation methods depends on the nature of the hazard having been properly defined in the first place. The development of vegetation cover is usually a good solution in achieving the stabilization of movable sand and dust, but in some circumstances, particularly in extremely arid areas, this cannot be done, so that sand fixation must depend on special surface coverings or man-made obstruction. For example, stabilisation may be based on wetting the surface, providing a cover of gravel or stones and crushed rock greater than 2 mm in diameter, or applying oil or chemical sprays to the sand surface. Finally, many kinds of fences are also used to control sand and dust movement, but usually to no permanently good effects.

6.6 Awareness of and Insurance Coverage of Natural Hazards

Attitudes regarding insurance protection against natural hazards vary from one country to another. In areas heavily exposed to natural disasters governments have intervened to provide insurance cover, e.g.

United States of America - Federal Insurance programme for Flood.

New Zealand - Earthquake and War Damage Fund.

Japan - Earthquake insurance under the 'Law concerning Earth-

quake Insurance'.

And in other countries where government has not become involved, the cover available may be limited, though pooling arrangements may help.

Until recently, nowhere in the Arab world has there been established a national pool against flood or earthquake risks. Coverage can be written as an endorsement to a standard policy; for example, in Iraq flood or earthquake risk is given in the form of extended coverage endorsement to fire policies. Flood can also be covered, by endorsement, in CAR/EAR policies. And in all cases additional premiums are required.

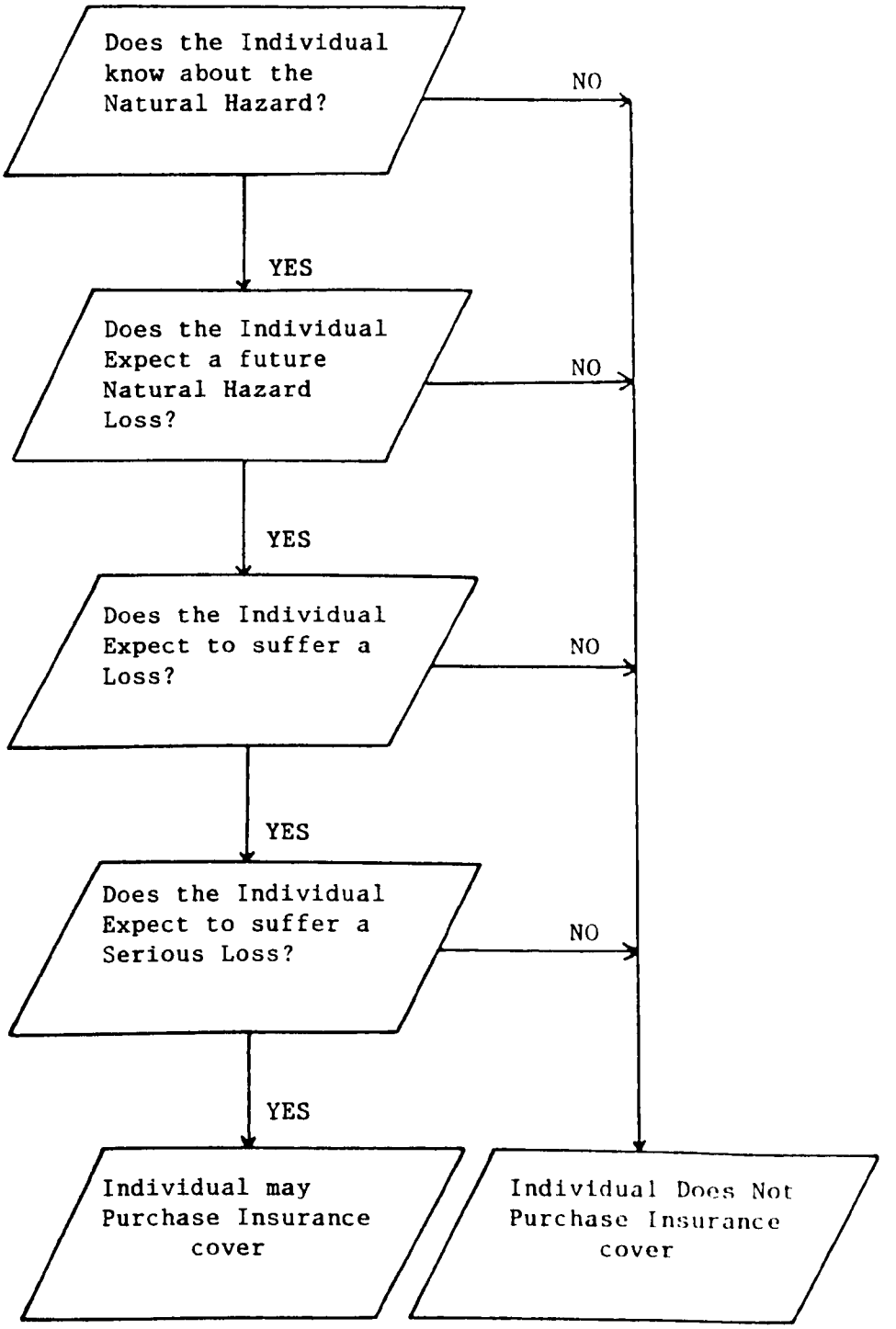
It is impossible to analyse the insurance demand for natural hazards without mentioning the awareness of natural hazards, since people, even those living in highly natural hazard prone areas, show a surprisingly low interest in insuring their property against these risks. Kunreuther (1984, p.208) has stated two main reasons for this process:-

1. People may underestimate the damages and/or probability of a disaster so that the cost of the premium would be significant relative to the perceived benefits of insurance protection. In addition, people may overestimate the cost of the policy, which may discourage them from purchasing insurance.
2. People assume the probability of a disaster is too low to constitute a threat, and even a considerationof the potential loss is not merited by them. If this hypothesis is correct, insurance will not even be considered as a viable option.

Figure 6.9 shows whether an individual is likely to

Figure 6.9

Individual's Decision to purchase Natural Hazard Insurance



purchase natural hazards insurance after he or she collects information indicating that insurance is available. Surprisingly, in view of the very real risk in the natural hazard prone areas, most people completely abstain from buying any kind of disaster insurance coverage for their property. For example, Themptander (1979, p.19) has pointed out that in most Latin American countries less than 10 percent of private dwellings and their contents are insured. According to Ficker (1983, p.22), even in highly developed California one finds similar low insurance interest; only 6 percent of the residents of the Los Angeles area have earthquake insurance, and in San Francisco the figure is 7 percent (1)

A questionnaire survey of flood (in communities that were part of the regular National Flood Insurance Programme in the United States) was carried out in 1974 (Kunreuther, et al, 1978, p.68). A total of 4231 people were sampled in 43 areas throughout the U.S.A. Of the 2055 respondents, 1103 were insured and 952 (46.3 percent) uninsured. Also an earthquake sample was chosen from a list of householders who had paid premiums during the period 1st August 1972 through 31st July 1973 to eight of the largest earthquake insurers in California. A total of 1975 were sampled, of whom 1005 were respondents, 460 were insured and 545 (54.2 percent) uninsured. Even though this survey was carried out in the flood and earthquake-prone areas, among relatively affluent people, these figures show that the percentage of uninsured people is very high. If this is

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(1) California earthquake premiums have increased from US $8.95 million in 1972 to US$ 50.21 million in 1981, with an average annual growth rate of 21.1 percent (Ficker, 1983, p.22).

the case with the U.S.A., how much worse the demand for insurance is in the Arab countries. As mentioned earlier there have been several examples of disasters affecting some Arab countries for which the impact of the insurance industry was negligible.

Many catastrophes of recent years have shown that only a small share of the economic loss has been paid by insurers and reinsurers. The following examples are worth noting in this respect:-

1. Earthquake in Managua in 1972, which caused damages amounting to US$1000 million, of which US$ 100 million (10 per cent) were insured losses.
2. Hurricane Agnes in 1972 caused damage amounting to US$ 3063 million, approximately US$ 97 million (3.2 percent) thereof being insured.
3. The power cut in New York in 1977 was produced by lightning, and the overall damage was estimated at US$1000 million of which US$ 30 million (3 percent) were insured.
4. Hurricane Allen in the Gulf of Mexico and the U.S.A. in 1980, producing damages totalling US$ 1000 million, the overall loss insured amounting to US$ 58 million (5.8 percent).
5. Earthquake in Italy in 1980 caused damages of approximately US$ 10,000 million, insured losses of US$ 40 million(0.4 percent). Further examples of the amount of insured damage relative to the total damages are given in table 6.5. This table is constructed, so as to give fundamental picture of the magnitude losses in the twenty-one major catastrophes and gives the most important ones from the insurance and reinsurance point of view.

Table 6.5

The World's Largest Natural Catastrophes 1970-1980

No.	Date	Place/country	Cause of Loss	Victims	Total damage (million)	Insured Loss (million)	%
1	31 May 1970	Peru	Earthquake	60,000	503	-	-
2	3 Aug. 1970	Corpus Christi(Texas)US	Hurricane 'Celia'	11	457	320	70.0
3	End Sept. 1970	Gujarat - India	Flooding	-	286	-	-
4	9 Feb. 1971	Los Angeles(California) US	Earthquake	45	532	30	5.6
5	End Aug. 1971	N. India,Bangladesh	Flooding	300	726	-	-
6	17/25 June 1972	East coast U.S.	Hurricane 'Agnes'	121	3063	97	3.2
7	21 July 1972	Philippines	Tidal wave	427	600	-	-
8	23 Dec. 1972	Managua/Nicaragua	Earthquake	10,000	1000	100	10.0
9	2/5 Apr. 1974	14 federal states.U.S.	Tornados	300	977	430	44.0
10	18 Sept. 1974	Honduras	Hurricane 'Fifi'	10,000	500	-	-
11	25 Dec. 1974	Darwin - Australia	Cyclone 'Tracy'	100	403	200	49.6
12	2/3 Jan. 1976	Northwest Europe	Cyclone 'Capella'	100	960	480	50.0
13	4 Feb. 1976	Guatemala	Earthquake	22,000	750	75	10.0
14	6 May 1976	Friuli - Italy	Earthquake	1,000	2,400	-	-
15	13/14 Jly. 1977	New York - U.S.	Power breakdown following lightning	-	1,000	30	3.0
16	12 June 1978	Japan	Earthquake	21	800	-	-
17	30 Sept. 1979	Dominica, PR, U.S.	Hurricane 'David'	3,000	2,000	250	12.5
18	3 Sept. 1979	10 States, U.S.	Hurricane 'Frederic'	31	2,300	750	32.6
19	16 Feb. 1980	California/Arizona,U.S.	Flooding landslides	36	500	18	3.6
20	4 Aug. 1980	California/Texas,U.S.	Hurricane 'Allen'	250	1,000	58	5.8
21	23 Nov. 1980	Italy	Earthquake	3,114	10,000	40	0.4

Source: Swiss Re. Sigma - different issues.

Furthermore, the tragic earthquakes in Algeria and North Yemen in recent years had no practical effect on the insurance companies of both countries or the international insurance and reinsurance market. Many people suffering damage obtained indemnity from their government, and many others remained without compensation.

6.7 Evaluation and Accumulation of Risk

6.7.1 Evaluation of risk

When evaluating a risk, there are three kinds of information available

(i) previous damage experience,

(ii) data about the subject matter including its damage susceptibility and

(iii) knowledge of the natural sciences.

Statistics of previous damage, if considered by themselves, are not a good measure of risk (Friedman, 1972, p.11), because changes occur over the years in:

1. Class of construction.
2. Exposure of structures to damage, including for some risks changes in environmental conditions.
3. Building codes.
4. Type and amount of insurance.
5. Costs of repair.
6. Deductible size.

Many studies have been carried out in order to try to determine the damages which would be caused today in various natural hazard prone areas, if a disaster similar to those in the past were to strike. The following three examples given by Berz (1984, p.138) show the cost of such probable disasters:-

1. A repetition of the 1906 San Francisco earthquake, or a major earthquake in the Los Angeles area, would today cost between U$50 and US $100 billion. According to Swiss Re (1982, p.8), the San Francisco earthquake caused insured losses of US $ 350 million. At today's prices this would cost the insurance companies about US$ 4.6 billion.
2. A repetition of the 1923 Tokyo earthquake would cost approximately U S$ 250 billion today, though because the percentage of indemnity is limited under the policy conditions, the loss insured would be much less than the actual cost of the damage.
3. Hurricane Betsy which in 1965, caused insured loss of US $ 715 million would cost (at the same price) about US$ 2 billion today. The insured damage of a 100 year hurricane in the same area, for example, would be estimated at three or four times this amount.

Despite the fact that the past loss experience may be required in order to give an indication of future risk evaluation, Friedman (1972, pp.12-13) has pointed out that a pure extrapolation into the future on the basis of past experience does not shed much light on the character of future risks. He contends that what is needed is not actual damage that has resulted from past events, but damage relating to the presentdistribution of properties from a recurrence

of past events.[1]. Hence, he recommends the construction of natural hazard simulations to provide a good means of assessing the loss potential.

6.7.2 Accumulation of Risk

The potential severity of natural hazard losses is rising (both in terms of total damage/loss of life and insured losses) because of:

(a) increase in exposures, and

(b) so far as insured losses are concerned, a more than proportional increase in the number of insured exposures.

The information in this sectionis intended to explain this point.

The accumulation of individual risks derived from natural hazards is more important in recent years for the following reasons:

1. There are indications that the insurance world's susceptibility to catastrophe is increasing because of the growth of population, property values, etc., in disaster-prone areas, while the frequency of natural hazards is not itself increasing. Since insurance is bought to cover the new developments, catastrophic losses have increased in both frequency and severity in recent years. According to the Swiss Re (Sigma No. 10, 1982) during the period 1970-1981, 1651 natural catastrophes

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(1) In order to evaluate the future risk of Agadir in Morocco, for example, emphasis should not be placed on what the 1960 earthquake cost, but on what it would cost if a comparable earthquake occurred today and affected the present distribution and value of properties.

and major losses were registered world-wide. Some 489 (i.e. 29.6 percent) out of 1651 were natural disasters.(1) During the observation period, 43.6 percent of the natural disasters were accounted for by flood, 41.5 percent by windstorms and 14.9 percent by earthquake. With regard to natural catastrophes, the annual average loss frequency was approximately 41 catastrophes for the period 1970-81. Above average figures were experienced at the beginning of the period, namely 1971 (46), and between 1975 and 1981, with the exception of 1977 (38). Table 6.6, figure 6.10, and figure 6.11 show the number and frequency of natural catastrophes during the 12 year period.

Table 6.6

World-Wide Number of Major Natural Catastrophes, 1970-1981

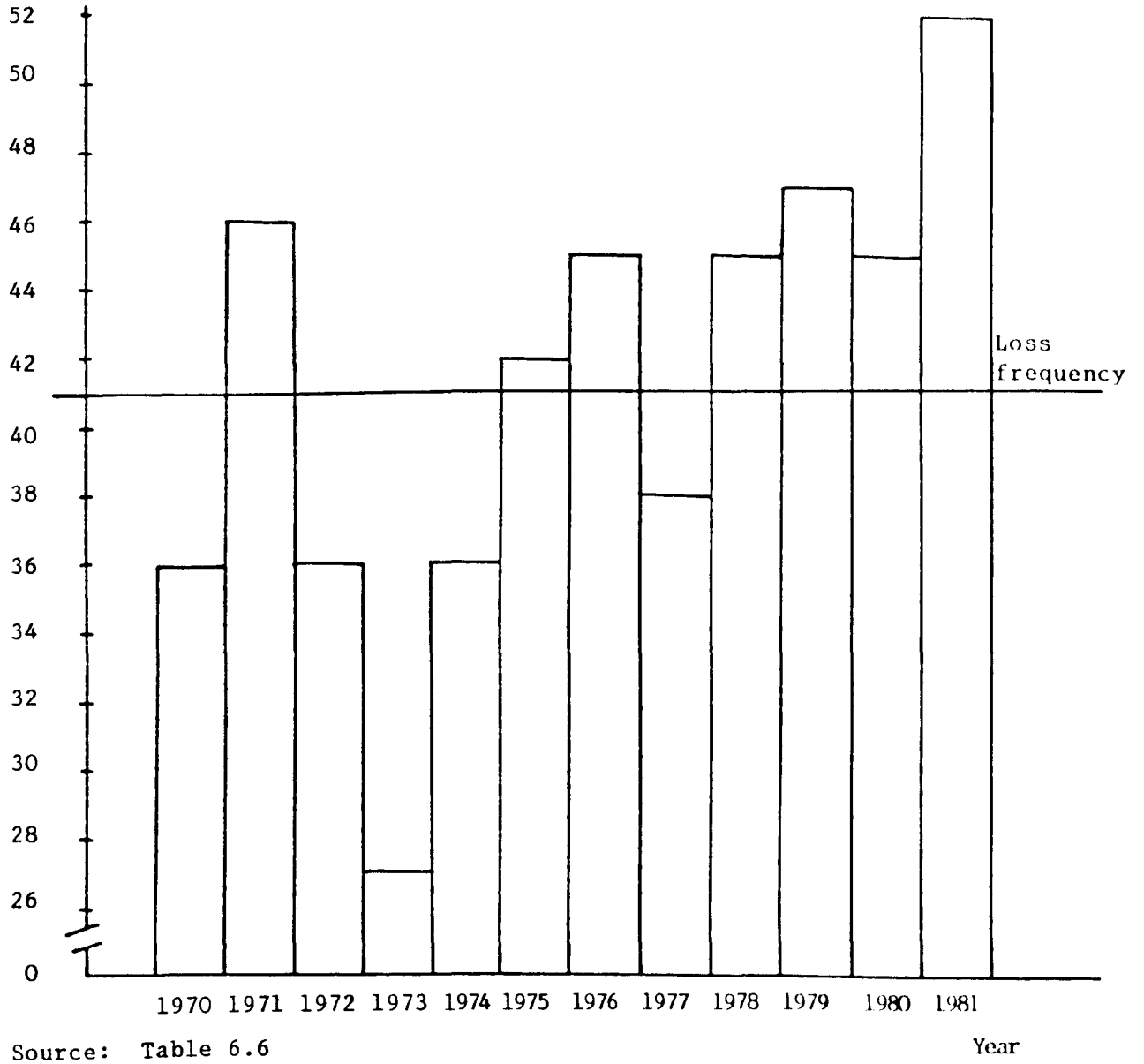
Natural catastrophes	70	71	72	73	74	75	76	77	78	79	80	81	Total	%
Flood,(inc.landslide,tidal wave lava,rock,mud, avalanche)·	18	21	17	12	19	19	18	17	15	18	16	23	213	43.6
Windstorms(cyclone,hurricane, tornado,typhoon, hail, snow)·	12	18	15	12	13	20	17	13	22	20	19	22	203	41.5
Earthquake	6	7	4	3	4	3	10	8	5	9	7	7	73	14.9
Total	36	46	36	27	36	42	45	38	42	47	42	52	489	100.0

Source: Sigma, No.10, 1982.

(1) In the early years of this century, there were only 3 major natural catastrophes per year, but this number has increased to 15 today (Munich Re, 1982, p.1.).

Figure 6.10

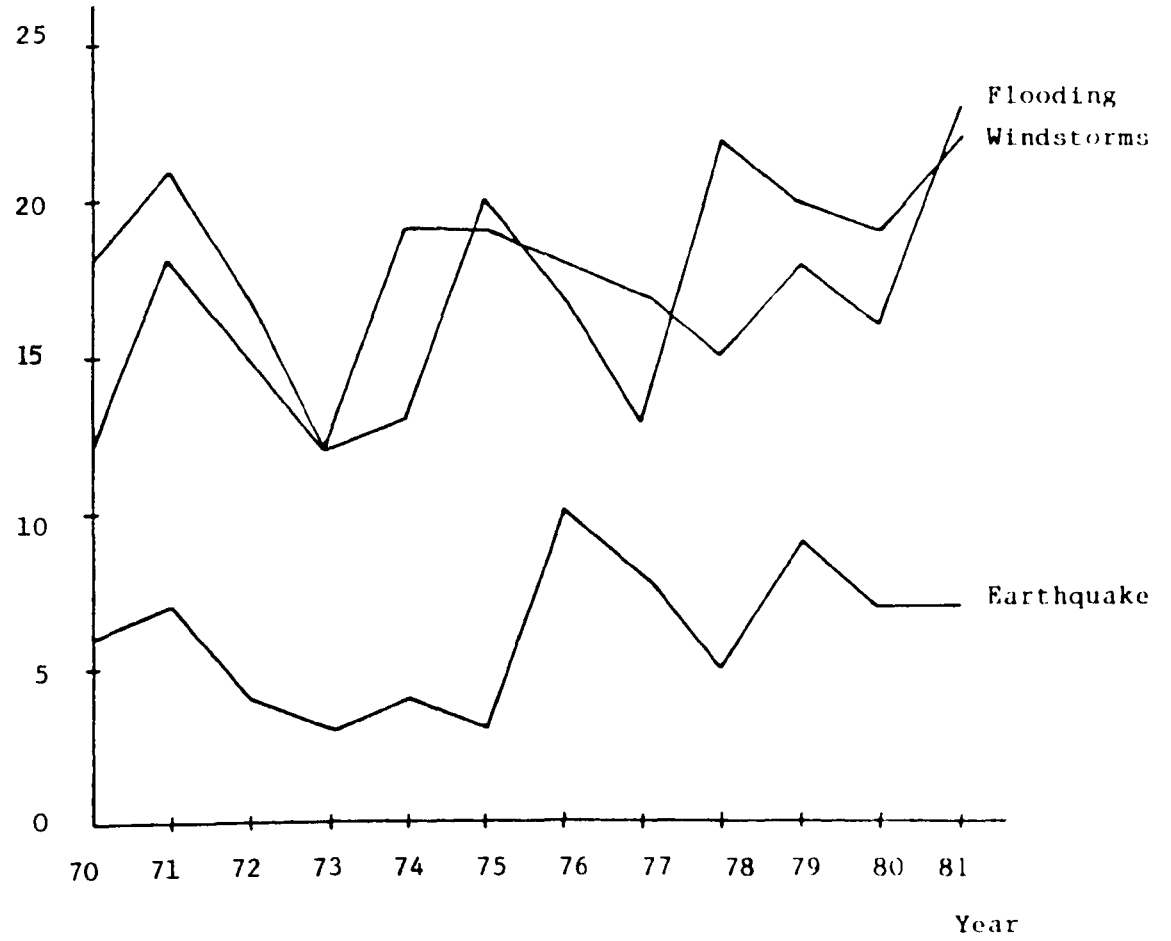
Total Loss Frequency of Natural Catastrophes



Source: Table 6.6

Figure 6.11

Frequency of Natural Catastrophes



Source: Table 6.6

2. The exposure to natural hazards throughout the world is rapidly increasing due to (Munich Re, 1982, p.1)[1]

   (a) Growth of the world's population.

   (b) Concentration of the population and property in cities.

   (c) Improved standards of living.

   (d) Urbanization and industrialization of especially exposed areas.

   (e) More hazardous technologies.

World-wide there has been a drift of population from rural to urban areas (see table 6.8) but nowhere more so than in parts of the Arab world (tables 6.7 and 6.8). At the same time most Arab countries have experienced a rapid increase in population, the total rising from about 92 million in 1960 to 168 million in 1981. One result has been the increase in the number of cities of over 500,000 people from 8 in 1960 to 22 in 1980, with another 61 of over 100,000 (see table 6.9), some in areas highly exposed to major natural disasters. This means that not only is there a higher concentration of people, but also of capital assets in urban areas which substantially raises the total and insured loss potentials of natural hazards (see the Maps in the Appendix).

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(1) This trend is most marked in the developing countries whose national economies are particularly susceptible to the serious effects of natural catastrophes as has been illustrated many times during the past years (Berz, 1984, p. 135).

Table 6.7

The Urbanization of the Arab World Population

Country	Urban population as a percentage of total population		Percentage of urban population of over 500,000 persons		Number of cities of over 500,000 persons		Increase in % of urban population
	1960	1980	1960	1980	1960	1980	1980/1960
Algeria	30	44	27	12	1	1	1.47
Bahrain	-	-	-	-	-	-	-
Egypt	38	45	53	53	2	3	1.18
Iraq	43	72	35	70	1	3	1.67
Jordan	43	56	0	37	0	1	1.30
Kuwait	72	88	0	0	0	0	1.22
Lebanon	44	76	64	79	1	1	1.73
Libya	23	52	0	64	0	1	2.26
Mauritania	3	23	0	0	0	0	7.67
Morocco	29	41	16	50	1	5	1.41
Oman	-	-	-	-	-	-	-
Qatar	-	-	-	-	-	-	-
Saudi Arabia	30	67	0	33	0	3	2.23
Somalia	17	30	0	0	0	0	1.76
Sudan	10	20	0	30	0	1	2.00
Syria	37	50	35	55	1	2	1.35
Tunisia	36	52	40	30	1	1	1.44
U.A.E.	40	72	-	-	0	0	1.80
South Yemen	28	37	0	0	0	0	1.32
North Yemen	3	10	0	0	0	0	3.33

Source: Extracted from the World Bank (1982, pp.148-9).

Table 6.8

The Urbanization of the World's Population

Country Group	Urban population as % of total population		Percentage of urban ppopulation in cities of over 500,000 persons.	
	1960	1980	1960	1980
Low-income countries(1)	13	18	31	41
Middle-income countries(2)	33	45	35	48
High-income countries(3)	30	66	0	34
Industrialized countries	68	78	48	55
Non-market industrial economies	49	62	23	32
Arab countries (unweighted)	31	49	39	47

Source: As for table 6.7.

Note: Weighted Average

(1) include two Arab countries.

(2) include eleven Arab countries.

(3) Four Arab countries only.

Table 6.9

Arab Cities of 100,000 or more Inhabitants Ranked by Size of Population

Rank	City/Country	Year and Source E=Estimate C = Census	City Proper	Urban agglomeration	Estimate 1980	Annual average growth rate 1970-79
1	Cairo, Egypt	1974(E)	5,715,000	-	6,550,433	3.1
2	Baghdad, Iraq	1965(C)	1,490,759	1,657,424	2,746,791	3.4
3	Alexandria, Egypt	1974(E)	2,259,000	-	2,589,227	2.3
4	Damascus, Syria	1975(E)/1970(E)	1,042,245	923,253	1,249,867	3.7
5	Giza, Egypt	1974(E)	853,700	-	978,496	2.3
6	Aleppo, Syria	1975(E)	778,523	-	933,609	3.7
7	Tunis, Tunisia	1966(C)	468,997	647,640	878,307	2.2
8	Riyadh, Saudi Arabia	1974(C)	666,840	-	829,267	3.7
9	Amman, Jordan	1975(E)	634,000	-	752,993	3.5
10	Jeddah, Saudi Arabia	1974(C)	561,104	-	697,776	3.7
11	Marrakech, Morocco	1971(C)/1973(E)	330,400	436,300	525,749	2.7
12	Oran, Algeria	1966(C)	327,493	328,257	476,651	2.7
13	Basra, Iraq	1965(C)	310,950	310,000	512,451	3.4
14	Fez, Morocco	1971(C)/1973(E)	321,460	426,000	513,337	2.7
15	Meknes, Morocco	1971(C)/1973(E)	244,520	403,000	485,621	2.7
16	Mecca, Saudi Arabia	1974(C)	366,801	-	456,145	3.7
17	Mosul, Iraq	1965(C)	264,146	264,146	436,166	3.4
18	Suez, Egypt	1974(E)	368,000	-	421,795	2.3
19	Oujda, Morocco	1971(C)/1973(E)	155,800	349,400	421,033	2.7
20	Tripoli, Libya	1964(C)	213,506	-	412,376	4.2
21	Kuwait City, Kuwait	1970(C)	80,405	217,749	404,923	6.4
22	Shubra-El Khema, Egypt	1974(E)	346,000	-	396,579	2.3
23	Port Said, Egypt	1974(E)	342,000	-	391,994	2.3
24	Tetouan, Morocco	1971(C)/1973(E)	137,080	308,700	372,989	2.7
25	Aden, Yemen D.R.	1973(E)	264,326	285,373	355,771	3.2
26	Khartoum, Sudan.	1971(E)	261,840	-	332,789	2.7
27	El Mahalla El Kubra, Egypt	1974(E)	287,802	-	329,871	2.3
28	Omdurman, Sudan	1971(E)	258,552	-	328,565	2.7
29	Tanta, Egypt	1974(E)	278,300	-	318,982	2.3
30	Homs, Syria	1975(E)	267,132	-	320,346	3.7
31	Kirkuk, Iraq	1965(C)	175,303	183,981	303,795	3.4
32	Sfax, Tunisia	1966(C)	79,595	215,836	292,709	2.2
33	Mogadiscio, Somalia	1972(E)	230,000	-	339,815	5.0
34	Zerka, Jordan	1975(E)	238,000	-	282,664	3.5
35	Aswan, Egypt	1974(E)	232,400	-	266,572	2.3
36	Bengazi, Libya	1964(C)	137,295	-	265,178	4.2
37	Safi, Morocco	1971(C)/1973(E)	129,100	214,600	258,597	2.7
38	Taif, Saudi Arabia	1974(C)	204,847	-	254,743	3.7
39	Medina, Saudi Arabia	1974(C)	198,186	-	246,459	3.7
40	Agadir, Morocco	1973(E)	-	189,000	227,748	2.7
41	Asyut, Egypt	1974(E)	197,200	-	226,027	2.3
42	Najaf, Iraq	1965(C)	134,027	135,622	223,943	3.4
43	Zagazig, Egypt	1974(E)	195,100	-	223,620	2.3
44	Ismailia, Egypt	1974(E)	189,700	-	217,481	2.3
45	Dmanhur, Egypt	1974(E)	175,900	-	201,613	2.3
46	Hawalli, Kuwait	1970(C)	106,542	-	198,124	6.4
47	Faiyum, Egypt	1974(E)	167,700	-	192,215	2.3
48	Khouribga, Morocco	1973(E)	-	159,000	191,598	2.7
49	Hama, Syria	1975(E)	162,310	-	194,283	3.7
50	Hilla, Iraq	1965(C)	84,704	111,335	183,845	3.4
51	Khartoum North, Sudan	1971(E)	127,672	-	162,267	2.7
52	Dammam, Saudi Arabia	1974(C)	127,844	-	156,984	3.7
53	Settat, Morocco			125,000	150,627	2.7
54	Minya, Egypt	1974(E)	131,200	-	150,379	2.3
55	Nouakchott, Mauritania	1976(C)	134,986	-	150,166	2.7
56	Sana, Northern Yemen	1970(E)	120,000	-	145,436	1.8
57	Port Sudan, Sudan	1971(E)	110,091	-	139,922	2.7
58	Damietta, Egypt	1974(E)	110,000	-	126,080	2.3
59	El Jadida, Morocco	1973(E)	102,000	-	122,911	2.7
60	Beni-suef, Egypt	1974(E)	107,100	-	122,756	2.3
61	Huluf, Saudi Arabia	1974(C)	101,271	-	125,938	3.7

Source: United Nations, Statistical Office (1977): Demographic Yearbook 1976, New York, U.N. Adopted from Potter, R.B. and Potter, P. (1978, pp.349-79). Estimate of population 1980 and growth rates extracted by the author.

Note:

(1) There is an apparent contradiction between Table 6.7 (which lists 22 cities of over 500,000 persons) and Table 6.9 which lists only 13 such cities. The author is aware of this contradiction, and it can be explained by the use of two different sources. Table 6.9 is taken from an estimated projection of population figures for 1980, U.N. Statistical Office in 1977. Table 6.7 however, is taken from a much more recent viz., World Bank Statistics, of 1982.

(2) Because of the population figures not being updated, many of the cities' population are less than actual figures; for example, the population in Cairo is more than 9 million and in Baghdad more than 3 million.

The high extent of loss in the case of a catastrophic event will affect several insurance branches, though the total loss potential is not the same as total insured loss potential, the difference being illustrated in figure 6.12 (Carter, 1981, p.11).

It is general practice, in property and fire insurance in particular, to grant an additional coverage for natural hazards. Loss accumulations in this type of insurance resulting from natural hazard are likely to be considerable. In view of this situation the insurer should seek to cover this accumulation risk for his retention. The most suitable type of reinsurance for protecting the insurer against such accumulation is catastrophe cover under which he can reduce his liabilities to a certain limit. Gerathewohl (1982, pp.135-141) has pointed out that if the insurer desires an effective protection from natural hazards, he must set up various zones in which the risks he keeps in his portfolio may accumulate. He argues that an 'accumulation control system' does provide a great amount of insight into the accumulation of risk. The following three steps are necessary to achieve this system:

1. Earthquake exposure zones.

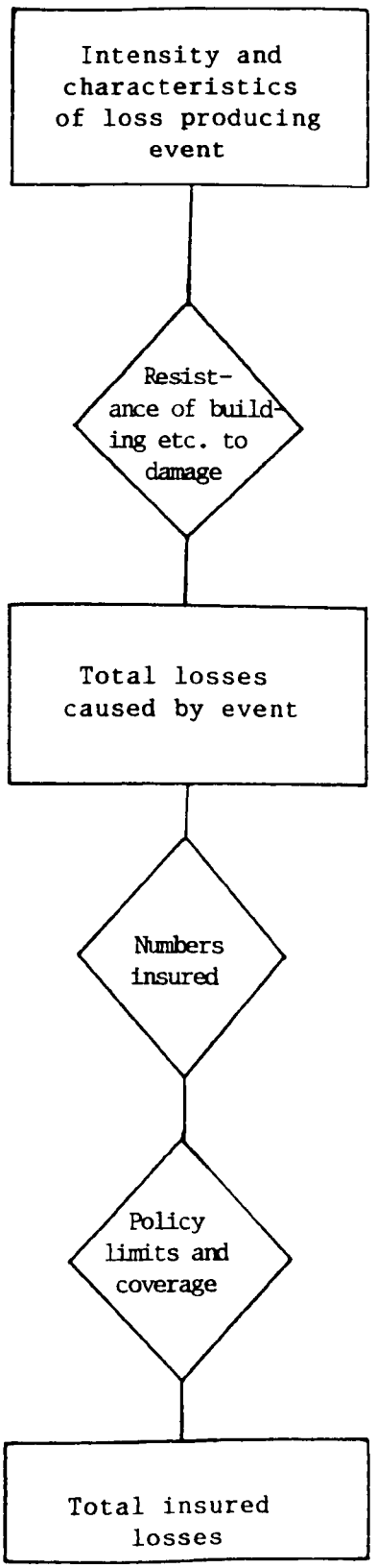
   The insurer needs to subdivide a country or region into earthquake exposure zones. In so doing the insurer can work out the return period and probable intensity of an earthquake in a specific zone. The main practical value from setting up such zones is the assistance this gives to the calculation of premium rates.

2. Earthquake loss accumulation zones.

   Past experience and seismotectonics within a specific

Table 6.12

Loss potential of Natural Hazards.



Source: (Carter, 1981, p.12)

area are very important factors in the setting up of loss accumulation zones. Such zones thus represent regions which may have been affected by one single earthquake only. Establishing loss accumulation zones depends on the insurer's underwriting policy, the structure of his portfolio, and his willingness to run a risk.

3. Earthquake assessment zones.

Having established the earthquake loss accumulation, the insurer must then split up these zones further into small earthquake accumulation assessment zones. When accumulation assessment zones have been determined, both direct insurers and reinsurers can then fix their liabilities for each zone. The subdivision of a country or area into relatively small accumulation assessment zones provides a clearer picture of concentration and distribution of values within the loss accumulation zones.

However, many insurers may lack sufficient information about the accumulation of risks exposed to one event. If the insurer does not know his overall liabilities derived from numerous individual losses caused by one loss event, there is little hope of the reinsurer getting it right. The reinsurer, who participates in a reinsurance treaty, has little idea of those hundreds of risks covered by the treaty, which are exposed to loss by one event. This is compounded when the reinsurer participates in a number of pro-rata treaties from that market and the shares in world-

wide quota share, surplus treaties and excess of loss covers which may have cessions from the same market. In this case the reinsurer will face substantial difficulties if he wants to ascertain the accumulation of risk. (Thorne, 1980, p.4). It is equally true of the direct insurers and is even more reason why reinsurers need to set up their own accumulation control systems.

6.8 Conclusions

The Arab world has a long record of natural hazards, which have led to considerable losses throughout recorded history. With the development of the economy, the expansion of population throughout the region and the settlement of hitherto sparsely inhabited areas, natural hazards pose an increasing threat to those exposed to them, and obviously are a major cause of concern to insurance companies.

The figures below provide some indication of the types of natural hazards which may be encountered around the Arab world. The full figures and information, of which the data below are merely the summary, are given in the Appendix and Maps, which show the potential for natural hazards, and the location of towns and development projects in relation thereto.

	Earthquake			Flood			Shifting Sand	Saline Soil etc.	Landslide	Gales
	Low exposure	Moderate exposure	High exposure	River	Coastal	Tsunami				
Number of towns (exceeding 100,000 population) exposed to natural hazards	129	33	1	11	35	24	47	61	12	19

One must appreciate that the impact of a disaster will tend to be much greater in a developing, as opposed to a developed, country, because although the amounts involved may be smaller, the relative impact on a developing country's economy and insurance industry is likely to be larger. Moreover in developing countries governments are not in a position, in the event of natural disasters, to indemnify their citizens sufficiently to provide them with living conditions equal to those they enjoyed before the event. This is exactly what has happened after earthquakes in Morocco (in 1960) Nicaragua (1972) Algeria(1981) and North Yemen(1982). But even the governments of some developed countries may not feel able to provide the same insurance provisions as, say, the U.S. Federal Insurance Program, or disaster relief after the event. Therefore the private insurance industry should try to respond by providing as much cover as is safely possible within the limits set by its financial resources.

In the past the losses incurred by Arab insurers as the result

of natural disasters have been relatively small. Now the situation is changing with the growth of demand for insurance in general and for cover against natural hazards in particular. Therefore insurers and reinsurers are having to take an increasing interest in the proper evaluation of such hazards, in that such knowledge is required in order to:

- fix the premiums and other terms for such insurances;
- determine the extent of possible accumulations of losses from any event;
- arrange catastrophe reinsurances.

Three main conclusions can be drawn from this study:

First, if Arab insurers are to meet the growing demand for insurances that provide cover for losses arising from natural hazards they will continue to be heavily reliant on the international reinsurance markets. Not only are many of the rapidly growing cities located in areas badly exposed to natural hazards but also some of the large risks discussed in Chapter five are being sited in such areas too. Thus, self-sufficiency in insurance for Arab countries is an impossible objective for these catastrophe risks, and the large risks too.

Secondly, insurance and reinsurance underwriters need to know a lot more about the risks they are being asked to insure. Although a lot of research has been undertaken by major international insurers and reinsurers much more remains to be done, not least in providing assessments in a form that would be instantly useful to any underwriter. The developments that are occurring in the earth sciences can

make major contributions to natural hazards assessments and insurance industries need to exploit more fully the information that is available.(1)

Thirdly, Arab insurers have got to learn how to control their exposures to accumulations of losses from natural disasters. Such control is necessary not only for their own protection but also to enable them to obtain the catastrophe reinsurance they need from domestic, regional and international reinsurers.

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(1) See Doornkamp, J.C. et al (1982).

APPENDIX 6.1

TOWNS AND TYPE OF NATURAL HAZARDS IN THE ARAB WORLD

No.	City/Country	Earthquake			Flood			Drifting Sand	Saline Soil etc.	Landslide	Tide
		Low exposure	Moderate exposure	High exposure	River	Coastal	Tsunami				
1	Arzew - Algeria	x					x		x	x	
2	Skikda - Algeria	x						x	x		
3	Hassi Massoud - Algeria		x				x		x	x	x
4	Algers - Algeria						x				
5	Bejel - Algeria	x					x				
6	Awali - Bahrain	x				x					x
7	Suez - Egypt	x				x		x	x		
8	Alexandria - Egypt	x				x			x		
9	Assut - Egypt								x		
10	Tanta - Egypt										
11	Ras azzawr - Kuwait	x				x					
12	Khawr Mufattah - Kuwait	x				x					
13	Marsa Matruch - Egypt					x					
14	Daura - Iraq	x			x				x		
15	Kirkuk - Iraq		x								
16	Basra - Iraq	x		x					x		
17	Baiji - Iraq	x			x				x		
18	Haditha - Iraq										
19	Samawa - Iraq							x	x		
20	Alwand - Iraq		x								
21	Qayarah - Iraq	x									
22	Zarqa - Jordan	x									
23	Mina Al-Ahmadi - Kuwait	x			x						
24	Mina Abdallah - Kuwait	x			x						
25	Shuaiba - Kuwait	x			x						
26	Tripoli - Lebanon		x		x						
27	Sidon - Lebanon		x		x						
28	Zawia - Libya	x						x			
29	Berga - Libya								x		
30	Ras Lanuf - Libya								x		
31	Nouadhibou - Maritania							x			
32	Mohammedia - Morocco	x					x		x		
33	Al-Jadida - Morocco	x					x				
34	Nado - Morocco	x					x			x	
35	Umm Said - Qatar	x				x					
36	Ras Tanura - Saudi Arabia	x				x		x	x		
37	Jedda - Saudi Arabia	x				x					x
38	Riyadh - Saudi Arabia										
39	Yanbu - Saudi Arabia					x			x		
40	Jubail - Saudi Arabia	x				x		x	x		
41	Rabegh - Saudi Arabia					x			x		
42	Abqaiq - Saudi Arabia							x			
43	Port Sudan		x						x		
44	Banias - Syria		x								
45	Homs - Syria	x									
46	Bizerte - Tunisia		x				x		x		
47	Gabes - Tunisia	x									
48	Hodeidah - North Yemen	x									
49	Aden - South Yemen	x						x			x
50	Al Amar - Bahrain	x									
51	Khor Al-Zubair - Iraq		x			x					
52	Tobruk - Libya	x									
53	Quriyat - Oman	x									
54	Gafsa - Tunisia	x									
55	Ruwais - U.A.E.					x			x		
56	Umm Al-Nor - U.A.E.								x		
57	Jebel Ali - U.A.E.								x		
58	Zelten - Libya							x			
59	Jebel - Libya							x			
60	Waha - Libya							x			
61	Defa - Libya							x			
62	Beda - Libya							x			
63	Ora - Libya										

APPENDIX 6.1 Continued

No.	City/Country	Earthquake			Flood						
		Low exposure	Moderate exposure	High exposure	River	Coastal	Tsunami	Shifting sand	Saline soil etc.	Landslide	Gale
64	Raguba - Libya							x			
65	Zaggut - Libya							x			
66	Amal - Libya										
67	Gidalo - Libya										
68	Emgayat - Libya							x	x		
69	Tlasin - Libya								x		
70	Al Gezira - Libya							x			
71	Hofra - Libya							x			
72	Dahra - Libya							x			
73	Hassi Messaoud - Algeria							x	x		
74	El - Gassi - Algeria							x			
75	El Agreb - Algeria							x			
76	La Reculee - Algeria							x			
77	Ohanet - Algeria							x			
78	Hassi Mazoula - Algeria							x			
79	O. Zenani - Algeria										
80	Tin Fouye - Algeria										
81	El Aded Lorache - Algeria							x			
82	Tan Emellal - Algeria							x			
83	Ouan Taredert - Algeria										
84	Edjeleh - Algeria							x			
85	Zarzaitine - Algeria										
86	Tamadanet - Algeria										
87	Askarene - Algeria										
88	Hassi R'mel - Algeria										
89	Belkataief - Algeria	x						x			
90	Ras Gharib - Egypt	x									
91	Rumaila - Iraq	x							x		
92	Al Amarah - Iraq		x		x				x		
93	Karatchuk - Syria										
94	Ain Zalah - Iraq	x									
95	Mushorah - Iraq	x									
96	Qasab - Iraq	x									
97	Natih - Oman										
98	Fahud - Oman										
99	Yibal - Oman										
100	Ghaba - Oman							x			
101	Abu Jibu - U.A.E.	x									
102	Bu Hasa - U.A.E.							x			
103	Habshan - U.A.E.							x	x		
104	Shamis - U.A.E.							x	x		
105	Al Asab - U.A.E.							x			
106	Zakum - U.A.E.	x									
107	Umm Sahif - U.A.E.	x									
108	Idd El Shargi - U.A.E.	x									
109	Maydam Mahzam - U.A.E.										
110	Halul - U.A.E.										
111	Sassan - U.A.E.										
112	Rostan - U.A.E.					•					
113	Fatch - U.A.E.	x									
114	Al-Mubarraz - U.A.E.	x									
115	Dukhan - Qatar	x					x				
116	Dammam - Saudi Arabia										
117	Dhahran - Saudi Arabia	x							x		x
118	Uthmaniyah - Saudi Arabia										
119	Shedgum - Saudi Arabia							x			
120	Abu Safah - Saudi Arabia										
121	Ras Al Mashib - Saudi Arabia					x			x		
122	Faiwaris - Saudi Arabia										
123	Qirdi - Saudi Arabia							x			
124	Kurays - Saudi Arabia										
125	Fazran - Saudi Arabia	x				x			x		

APPENDIX 6.1 Continued

No.	City/Country	Earthquake			Flood			Shifting sand	Saline soil etc.	Landslide	Gale
		Low exposure	Moderate exposure	High exposure	River	Coastal	Tsunami				
126	Manifa - Saudi Arabia	x				x			x		
127	Khafji - Saudi Arabia	x				x					
128	Umm Qasba - Saudi Arabia	x									
129	Marjan - Saudi Arabia										
130	Zuluf - Saudi Arabia	x									
131	Shaybah - Saudi Arabia										
132	Burgan - Neutral Zone										
133	Bahrah - Kuwait	x									
134	Raudhatain - Kuwait	x									
135	Mutriba - Kuwait										
136	Annaba - Algeria	x									
137	Oran - Algeria	x					x		x		x
138	Bejaia - Algeria		x				x				
139	Bami Saf - Algeria	x							x		
140	Chercehll - Algeria		x				x			x	
141	Manama - Bahrain	x									
142	Sitra - Bahrain	x									
143	Abu Zenima - Egypt	x									
144	Adabiya - Egypt	x				x					
145	Ain Sikhna - Egypt	x				x			x		
146	Port Said - Egypt	x				x			x		x
147	Damiett - Egypt	x				x			x		x
148	Ras Amir - Egypt	x				x			x		
149	Ras Shukheir - Egypt	x									
150	Safaga - Egypt	x									
151	Wadi Feiran - Egypt	x				x					
152	Kosseir - Egypt	x									
153	Sudr - Egypt	x				x					
154	W. Wardan - Egypt	x									
155	Ras Malarma - Egypt	x									
156	Fao - Iraq					x			x		
157	Umm Qasr - Iraq					x					
158	Khor Al-Amaya - Iraq				x						
159	Mina Al-Baker - Iraq					x					
160	Aqaba - Jordan		x							x	x
161	Shuwaikh - Kuwait	x				x					x
162	Umm Gudair - Neutral Zone										
163	Wafra - Neutral Zone										
164	Mina Saud - Neutral Zone	x									
165	Abdali - Kuwait										
166	Beirut - Lebanon		x								
167	Tyre - Lebanon	x				x					
168	Jounieh - Lebanon		x								
169	Tripolo - Libya	x							x		
170	Misurata - Libya	x							x		
171	Benghazi - Libya	x							x		
172	Derna - Libya	x									
173	Nouakchott - Mauritania										
174	Dellys - Algeria		x				x				
175	Tenes - Algeria		x				x			x	
176	Mestghanem - Algeria		x				x			x	
177	Casablanca - Morocco	x					x				x
178	Tangier - Morocco	x					x				
179	Safi - Morocco		x				x				
180	Agadir - Morocco	x					x				
181	Ceuta - Morocco	x					x				
182	Essaouira - Morocco		x				x				
183	Melilla - Morocco	x					x				
184	Lyautey - Morocco	x					x				
185	Ghazawet - Morocco	x					x				
186	Tan Tan - Morocco	x									
187	Salalah - Oman	x									
188	Raysut - Oman	x									

APPENDIX 6.1 Continued

No.	City/Country	Earthquake			Flood						
		Low exposure	Moderate exposure	High exposure	River	Coastal	Tsunami	Shifting sand	Saline soil etc.	Landslide	Gale
189	Mina Qaboos - Oman	x									
190	Doha - Qatar	x				x					x
191	Jazirat Abu Ali -Saudi Arabia	x				x			x		
192	Al Khober - Saudi Arabia	x						x	x		
193	Ras Al-Ghar - Saudi Arabia	x				x			x		
194	Duba - Saudi Arabia	x									
195	Al-Wajh - Saudi Arabia	x									
196	Al-Qadima - Saudi Arabia					x			x		
197	Berbera - Somalia		x					x			x
198	Suakin - Sudan		x								
199	Tartous - Syria		x								
200	Latakia - Syria		x								
201	Jeble - Syria		x								
202	Sfax - Tunisia		x								
203	Tunis - Tunisia		x				x		x		x
204	Sousse - Tunisia		x								
205	La Sekhira - Tunisia		x						x		
206	Jebel Dhanna - U.A.E.								x		
207	Shiek Rashid - U.A.E.		x					x			
208	Sharjah - U.A.E.		x					x			
209	Ajman - U.A.E.		x					x			
210	Zayed - U.A.E.								x		
211	Umm Al-Qawain - U.A.E.		x					x			
212	Fujairah - U.A.E.		x					x			
213	Mukalla - South Yemen		x								
214	Mokha - North Yemen	x									
215	Saleef - North Yemen	x									
216	Cairo - Egypt	x							x		
217	Damascus - Syria	x									
218	Giza - Egypt							x			
219	Aleppo - Syria	x									
220	Amman - Jordan	x									
221	Marakesh - Morocco	x								x	
222	Fez - Morocco	x								x	
223	Meknes - Morocco	x								x	
224	Mecca - Saudi Arabia										
225	Mosul - Iraq	x			x						
226	Oujda - Morocco	x								x	
227	Shubra El-Khema - Egypt	x			x				x		
228	Tetouan - Morocco	x					x			x	
229	Khatoum - Sudan										
230	El Mahalla El-Kubra - Egypt	x							x		
231	Omdurman - Sudan										
232	Tanta - Egypt	x							x		
233	Aswan - Egypt										
234	Taif - Saudi Arabia										
235	Medina - Saudi Arabia								x		
236	Najaf - Iraq								x		
237	Zagazig - Egypt	x							x		
238	Ismailia - Egypt	x						x			
239	Damanhur - Egypt	x							x		
240	Hawalli - Kuwait	x									
241	Faiyum - Egypt								x		
242	Hama - Syria	x									
243	Hilla - Iraq								x		
244	Settat - Morocco	x									
245	Minya - Egypt										
246	Sana - North Yemen				x						
247	Reni-Suef - Egypt										
248	Hufuf - Saudi Arabia							x			
249	Subaith - Kuwait										
250	Al-Maqwa - Kuwait	x									
251	Jadaciyah - Kuwait	x									
252	Al-Ahmadi - Kuwait	x									
		129	33	1	11	35	24	47	61	12	19

CHAPTER SEVEN

MEASURES TO INCREASE NATIONAL AND REGIONAL RETENTION CAPACITY

7.1 Introduction

Retention capacity in the Arab insurance market is limited by various factors, such as the unbalanced state of their insurance portfolios, a lack of adequate capital and free reserves, and insufficient knowledge and technical experience in the insurance business in general. Consequently, Arab insurance markets are obliged to make heavy purchases of reinsurance from abroad. One result of this is that an increased outflow of insurance business resulting from foreign reinsurance may lead to an increased net outflow of foreign exchange, but this outflow differs from one country to another according to the features of each country's portfolios.

Many Arab countries have concluded that the national retention capacity of their markets might be much better utilised through the formation of national and regional reinsurance companies. Furthermore at a time when many insurance and reinsurance companies felt that retention capacities at both the individual company and national market levels were too low to absorb the increasing values at risk, it was decided through the General Arab Insurance Federation to establish reinsurance pools in order to maximise the regional retention capacity and so reduce the reinsurance premiums ceded outside

the region.

The main purpose of this chapter is:

- to appraise the Arab reinsurance companies and reinsurance pools as measures for increasing retention capacity, and
- to discover whether they have achieved their objectives.

7.2 Formation of Insurance and Reinsurance Pools

7.2.1 Reasons for Setting up a Pool

Osler, et. al. (1972, p.120) define a pool as follows:

> 'An organization of insurers or reinsurers through which particular types of risks are underwritten with premiums, losses, and expenses shared in agreed amounts'.

Another definition of a pool has been given by Cockerell (1980, p.145):

> 'A pool is created when a number of insurers agree that all insurances of a defined character shall be shared among them in specified proportions'.

Here a pool will be defined as:

> "An arrangement by which a group of insurance and reinsurance companies, in a country or within a region, agree to cede risks of a certain class, or classes, to the pool, and to share the aggregate risks in accordance with a predetermined distribution plan".

From the above definitions it can be seen that a pool may be considered as reciprocity at its highest point of development, and UNCTAD has encouraged developing countries to form pools as a means of increasing their local market capacities. Among the other reasons that have been given,Gerathewohl (1980, p.122) lists the following:

1. To cover 'rare' risks by forming a portfolio to which the law of large numbers is applicable.
2. To cover particularly large risks whose exposure cannot be assessed by the insurer.
3. To provide cover for classes of insurance exposed to a risk of catastrophic accumulations of losses.

Pools arranged for nuclear energy risks and offshore oil rig facilities are two examples of arrangements which enable companies to combine resources and attain sufficient collective capacity for underwriting such complicated risks.

The concept of Arab reinsurance pools was evolved at the first conference of the General Arab Insurance Federation (GAIF) following the establishment of that Federation in September 1964. According to the GAIF, the reasons for setting up pools in the region were:

1. To achieve closer collaboration between the insurance and reinsurance company members of the Federation. By redistributing reinsurance business, a pool may assist companies in retaining part of the reinsurance premiums that usually leave the Arab region.
2. To minimise the net outflow of foreign exchange resulting from foreign reinsurance, at both the national and regional level.
3. To facilitate the acceptance of reinsurance as well as retrocession business originating from within or outside the region, and providing additional underwriting capacity within the area.
4. To create a better understanding among the Arab insurance

markets by increasing co-operation among companies in such fields as the dissemination of knowledge about insurance theory, loss prevention, claim handling and the distribution of information and statistics regarding the business transacted by the pools.

It was felt that the members of the GAIF enjoyed four advantages conducive to the success of the pools. Firstly, they had a common language and similar economic and social environments. Secondly, there were similarities in their insurance experience, problems and risk characteristics. Thirdly, the Arab geographic area is large enough to provide an adequate spread of risks and to make the pools economically worthwhile. Fourthly, there were no currency exchange difficulties between countries to overcome. Yet despite such advantages the pools have not achieved the degree of success that had been hoped for.

7.2.2 Advantages and Disadvantages of Setting up a Pool

Besides enabling its members to achieve one or more of the objectives detailed above, a well-managed pool can confer other benefits. UNCTAD (1980, p.9) has argued that a pool may be:

1. Highly responsive to the changing needs of its members;
2. Inexpensive to operate because of its very nature and relatively simple structure.
3. Able to secure, for common account, reinsurance protection on favourable terms.

On the other hand, pools have their disadvantages too. As

Carter has pointed out (1979, p.46), disagreements are likely to arise between members if the results of the business they cede to the pool vary substantially: members that pool profitable business cannot be expected in the long run to continue to accept unprofitable business in return. Also, a pool may restrict competition between members and hinder the larger members in taking advantage of their superior knowledge and expertise, particularly in the field of loss prevention. Likewise the knowledge that a substantial part of the business accepted will be passed on to the pool provides no encouragement for individual companies to undertake research and to improve their underwriting techniques. Finally, there is the danger of a pool being exposed to an accumulation of risk, if, unknown to the pool managers, several member companies have accepted shares of the same large risk, or risks exposed to losses from one event, which they then cede to the pool.

7.2.3 Types of Pools

There are two kinds of pool arrangement: The national insurance pool, and the regional reinsurance pool.

7.2.3.1 National Insurance Pool

In many developed and developing countries with insurance markets consisting of a substantial number of insurers, national pools have been organised to handle classes of insurance that either require the mobilisation of exceptionally large amounts of under-

writing capacity (e.g. nuclear and aviation insurances), or where the underwriting results are so poor that individual insurers may be unwilling to write the business (e.g. the Philippines motor insurance pool). Often such pools are organised on a net line basis, i.e., each member company accepts a share of the pool business which it will wholly retain for its own account, so that the pool operates as a form of coinsurance arrangement. Some examples of national pools are listed in Table 7.1

Although national pools avoid the foreign currency problems associated with regional pools, they can suffer from a number of limitations, such as smaller underwriting capacity and more narrowly spread portfolios of business, which in some cases are exposed to a relatively higher accumulation risk.

Table 7.1

Examples of National Pools in Developing and Developed Countries by the end of 1980.

Country	Name of Pool	No. of member companies	Establishment date
Finland	The Finnish Aviation Ins.pool	28	1919
Denmark	The Danish Aviation Ins. pool	17	1919
Norway	The Norwegian Aviation Ins. pool	26	1919
Sweden	The Swedish Aviation Ins.pool	22	1919
Switzerland	The Swiss pool for Aviation Ins.	35	1947
Finland	The Finnish Atomic Ins.pool	28	1957
Finland	The Finnish General Ins.pool	20	1964
South Korea	Korean Atomic Energy Ins.pool	14	1971
Kenya	Kenya Motor Ins. pool	All co's writing motor insurance in Kenya.	1975
France	The French pollution pool.	70	1977
W.Germany	The German pharmaceutical liability pool.	n.a	1978

Source: Extracted from UNCTAD 1980, Annexe III, pp.1-4.

Excluding those countries with markets controlled by one or a small number of state insurance companies in which insurance business is, in effect, already pooled, so far no national pools have been established in the Arab region.

7.2.3.2 Regional Reinsurance Pool

A number of regional pools have been established around the world, including the following five Arab pools:(1)

- Aviation pool (1968).
- Engineering pool (1968).
- Fire pool (1971).
- Marine Cargo pool (1972).
- Marine Hull pool (1974).

7.2.3.2.1 Management of Regional Pools

The management of a regional pool is always entrusted to one of the pool's member companies. The members of the pool delegate

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(1) In other developing countries their are several reinsurance pools, such as (1) Asian Reinsurance Pool. It was established in 1969 and has one member from each of the following Asian countries: Hong Kong, Indonesia, Japan, Malaysia, Philippines, Republic of Korea, Singapore, and Thailand. (2) Fair Reinsurance Pool, established in 1974 with 56 member companies of which 21 are from Africa and 35 from Asia. (3) PLAR Reinsurance Pool, established in 1969 with 16 member companies from Latin America and 6 companies from outside the area (Indonesia, Iran, Italy, Republic of Korea, and Turkey. (4) RCD Reinsurance Pool, which comprises three countries, Iran, Pakistan and Turkey (UNCTAD, 1980, Annex II pp.2-4).

certain underwriting and other functions to the managing company acting collectively for them. All the business written by the managing company is accepted on behalf of the members, each of whom takes a share of that business onto his books, and any profits or loss, after payment of all incurred expenses, is distributed amongst the members.

Since the managing company plays a vital role in the success of a pool, the following factors should be taken into account in its selection:

1. The technical knowledge of the people who will handle the pool's business (normally a managing company will appoint a small group of its staff to run the pool);
2. Its geographical location (which should possess good communications, banking facilities, etc.);
3. Its marketing knowledge and reputation; and
4. The adequacy of its financial base.

The major functions of a managing company have been listed by UNCTAD (1980, p.4), as follows:

1. To underwrite business from members, and non-member companies (if permitted).
2. To request non-members to join the pool. The larger the membership, the larger will be the volume of business ceded to it.
3. To advise and influence members regarding the overall quality of the business accepted by the pool.
4. To fix the retrocession shares of the members, generally in proportion to the volume of business ceded (usually measured

in terms of premium income).

5. To inform the members periodically of the status of their accounts, adjusting balances among them in the manner of a clearing house.

6. To arrange, when necessary, an excess of loss cover for the common account against unforseen excessive accumulation or catastrophes.

7. To prepare an annual report in the form of statistical analysis of the pool's operations and its profitability during the previous year.

In return for its services the managing company will be compensated for expenses incurred, usually by the payment of an overriding commission of between 2.5 percent and 5 percent of the pool's premium volume.

The five Arab pools are managed by the following companies:

Pool	Managing Company
Aviation	Societe Centrale de Reassurance Morocco (formerly by the Misr Insurance Company, until Egypt left the GAIF in December 1979).
Engineering	Iraq Reinsurance Company.
Fire	Tunisienne Reassurance Company (prior to 1982 by the Societe Tunisienne Assurance et de Reassurance).
Marine Cargo	Kuwait Reinsurance Company (prior to 1982 by the Gulf Insurance Company Kuwait).
Marine Hull	Societe Centrale de Reassurance, Morocco.

The change in the management of the marine cargo pool was

the result of a decision by the GAIF in 1977 that the pools should be managed by reinsurance companies.

Over the last 15 years many members of the pools have criticised their management, lack of growth and profit records. The issue was discussed at the 1982 Bahrain Conference but no decisions were taken; there is the fear that any change in management may create an unsettled situation which would adversely affect a pool's performance. Yet it is recognised that the decision to place all of the pools in the hands of reinsurance companies was not altogether wise: the Tunisienne Reinsurance Company, for example, which was only formed in 1981, lacked the experience to run the fire pool to its full potential.

7.2.3.2.2 Business Cessions to Regional Pools and Redistribution to its Members

Every member of a pool must cede a share of its business which falls within the scope of the pooling arrangement. The pool's business depends on the geographical scope of the pool. Some pools comprise business emanating from a specific area, whilst others operate on a world-wide basis, excluding certain countries. Thus business from non-member companies may be ceded to the pool in order to improve the balance of the pool's portfolio.

All business ceded to the pool has to be distributed among the members. The usual practice is to share retrocessions among all members, depending on the amount of the premium or profitability ceded by the member. Consequently the members receive back through

retrocessions a part of the business they have themselves ceded to the pool. Any business written by the pool in excess of the total of the member's shares will have to be ceded to other reinsurers.

Membership of the Arab regional pools is open only to insurance and reinsurance companies that are members of the GAIF. Although Arab reinsurance companies are allowed to accept business from the pools, in order to reduce the danger of accumulations they do not cede business to the pools. The geographical scope of the marine cargo, hull and fire pools is confined to business emanating from the Arab world and Arab interests located outside the Arab area. The aviation and engineering pools are on a world-wide basis. The capacity of each pool is limited to the combined retention capacity of the members, supplemented by excess of loss cover for the fire and aviation pools.

Despite the fact that conditions were favourable for the establishment of the pools, their performance is open to question on a number of counts.

First, as shown in Table 7.2, the number of member companies that have ceded business to the pools is small in comparison to the total membership of the GAIF, which in 1980 exceeded 100. Many companies have been reluctant to become pool members because of the firm ties they have with foreign brokers and reinsurers, and the favourable terms on which they are able to place their reinsurances. Other companies do not like to change their established practices, or they may not be familiar with many of the technicalities of reinsurance underwriting.

Generally speaking, other reasons suggested by UNCTAD (1980,

Table 7.2

Development of Arab Reinsurance Pools Capacity and Members[1]

Year	Aviation			Engineering			Fire			Marine Cargo			Marine Hull		
	Capacity	Ceding Cos.	Accepting Cos.	Capacity	Ceding Cos.	Accepting Cos.	Capacity	Ceding Cos.	Accepting Cos.	Capacity	Ceding Cos.	Accepting Cos.	Capacity	Ceding Cos.	Accepting Cos.
	US$			£			US$			US$			US$		
1968	150,000	n.a	8	137,700	8	10	-	-	-	-	-	-	-	-	-
1969	250,000	n.a	8	"	8	11	-	-	-	-	-	-	-	-	-
1970	300,000	n.a	17	"	8	11	-	-	-	-	-	-	-	-	-
1971	"	n.a	17	"	9	11	250,000	10	16	-	-	-	-	-	-
1972	"	n.a	17	"	14	14	"	10	17	50,000	7	10	-	-	-
1973	330,000	n.a	20	"	10	14	"	11	18	"	9	8	-	-	-
1974	"	n.a	20	250,000	14	17	300,000	12	19	"	11	7	111,000	n.a	12
1975	400,000	n.a	22	"	21	21	"	12	24	140,000	11	11	150,000	n.a	15
1976	750,000	n.a	27	500,000	24	23	500,000	17	30	"	13	12	222,000	n.a	17
1977	"	n.a	20	US$1,700,000	26	27	600,000	18	33	145,000	14	12	222,000	n.a	17
1978	"	n.a	20	"	24	27	"	18	21	"	13	13	250,000	n.a	19
1979	"	n.a	21	"	23	27	650,000	18	22	"	12	11	"	n.a	21
1980	1,000,000	n.a	35	US$2,500,000	18	25	"	15	19	"	10	9	"	n.a	20

Source: Annual reports of the managing companies

Note: The maximum capacity of the engineering pool is in the CAR and EAR risks.

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(1) The numbers of the Pools members in 1981 and 1982 were:

Pool	(1981) Ceding	(1981) Accepting	(1982) Ceding	(1982) Accepting
Aviation	10	34	10	35
Engineering	13	23	12	25
Fire	12	18	n.a	n.a
Marine Cargo	9	17	7	17
Marine Hull	6	20	8	21

Source: Figures presented by the GAIF.

pp. 12-13) include:

(a) a reluctance to be involved in the redistribution of business with companies of whom they have little knowledge;

(b) Lack of confidence in the management of the pools concerning the acceptance of risks to be redistributed;

(c) Lack of confidence in the solvency and ability of other companies to adjust balances promptly;

(d) Fear of accumulation of heavy losses which has limited the pools acceptances.

Secondly, the pools have not grown as fast in terms of premium income as may have been expected, given the rate of growth of direct insurance business in the region since the early 1970s. In the case of marine business, the formation of the separate cargo and hull pools may have deterred companies with combined cargo and hull treaties from ceding business to the pools.

Thirdly, the geographical limitation of the fire, marine cargo and hull pools to the Arab world, which accounts for only a small proportion of the total world business, restricts their growth potential. There is no reason why these pools should not be extended to include international business.

Finally, the pools, except the engineering pool, have failed to increase substantially the region's underwriting and retention capacities relative to the size of risks that require insurance in the Arab countries. For example, the fire pool's capacity in 1980 was still only US $650,000, which was less than 0.2 per cent of the value (of between $400 - 600 million) of a single oil refinery

with a tank farm and terminal in the Gulf area, and a mere 0.65 per cent of one refinery process unit costing $100 million upwards.

7.2.3.2.3 The Experience of the Arab Reinsurance Pools

Buol (1981, p.9) has argued that insurance, and particularly reinsurance, are services which can only be provided on a fairly large scale, below which neither the technique nor the economics of insurance and reinsurance can operate to the satisfaction of the users. He adds that regional pools are no exception to this rule. Having already criticised the Arab pools for their small capacities, it is now proposed to examine their size in terms of premium income and their results, bearing in mind Buol's remarks.

The Engineering Pool

The pool accepts all kinds of engineering risks and as from 1st January 1980, it has included computer insurances within the scope of its treaty. It is the largest pool in terms of underwriting capacity, which has been increased from £137,700 in 1968 to US$2.5 million in 1980. This capacity is 2.5 times that of the aviation pool, about 4 times of fire, 10 times of marine hull, and 17 times of marine cargo.

The importance of the pool is the direct result of the construction boom including many large projects, that has occurred as part of the development plans of Arab countries, and which suddenly made engineering insurance one of the most important classes of insurance. The managing company has increased the capacity of the

pool due to; (a) response to the demand for engineering insurance, including the rise in sums insured due to inflation and the increasing size of investment projects, and (b) the entry of new companies to the pool, and the willingness of member companies to increase their acceptance limits, partly following increases in the capacity of their own treaties. Nevertheless individual member companies' retention limits, and thus the capacity of the pool, remain very small relative to the sums insured required for many construction projects.

The underwriting results of the pool, since its inception, broken down into underwriting years, are shown in Table 7.3 and Figure 7.1. During the period 1969-1973 the annual premium income was very modest, although the pool extended its acceptances to include risks on a worldwide basis as from 1st January 1971. Since 1974 there has been a noticeable increase in the premium income, but it still remains relatively small, due to the reasons mentioned earlier, plus the fact that the participation share of business accepted by the pool from its members' reinsurance treaties was small, which left part of the pool's underwriting capacity unabsorbed.

Table 7.3 also shows that in 1980 most of the pool's members accounts were not received by the managing company. The later the year the more provisional is the underwriting result shown: in particular all of the figures for 1980 will be subject to substantial adjustment as more premiums and claims are reported by the ceding companies, and outstanding claims are settled. However, if the last two years are excluded, the overall technical profit for the years 1968-78 was very high at 24.6 percent of total premiums.

If the provisional figures for 1979 and 1980 are included, the techn-cal profit is even higher at 29.6 percent.

Table 7.3

Results of Engineering Reinsurance Pool - Underwriting Years (1968-1980).

Currency:US$

Under writ-ing year	Premium Income	Commission	O/R Commission	Paid Claims	Outstand-ing Claims	Underwrit-ing result profit (loss)	Result as % premium income
1968	50708	16164	1268	22450	117	10709	21.1
1969	37550	10901	940	17980	2384	5345	14.2
1970	41894	12172	1045	11921	-	16756	40.0
1971	122611	37027	3065	23168	-	59351	48.4
1972	147969	43190	3707	42622	-	58450	39.5
1973	176539	50079	4414	40236	770	81040	45.9
1974	380792	111592	9519	91052	50793	117836	30.9
1975	868645	278092	21716	173495	175185	220157	25.3
1976	768908	252367	19220	194998	237481	64852	8.4
1977	795791	268759	19901	127511	153033	226587	28.5
1978	763192	249858	19081	65926	155457	272870	35.8
1979	944147	326931	23605	47529	233191	312891	33.1
1980	333226	117694	8330	3359	42558	161285	48.4
	5431972	1774826	135811	862247	1050969	1608119	29.6

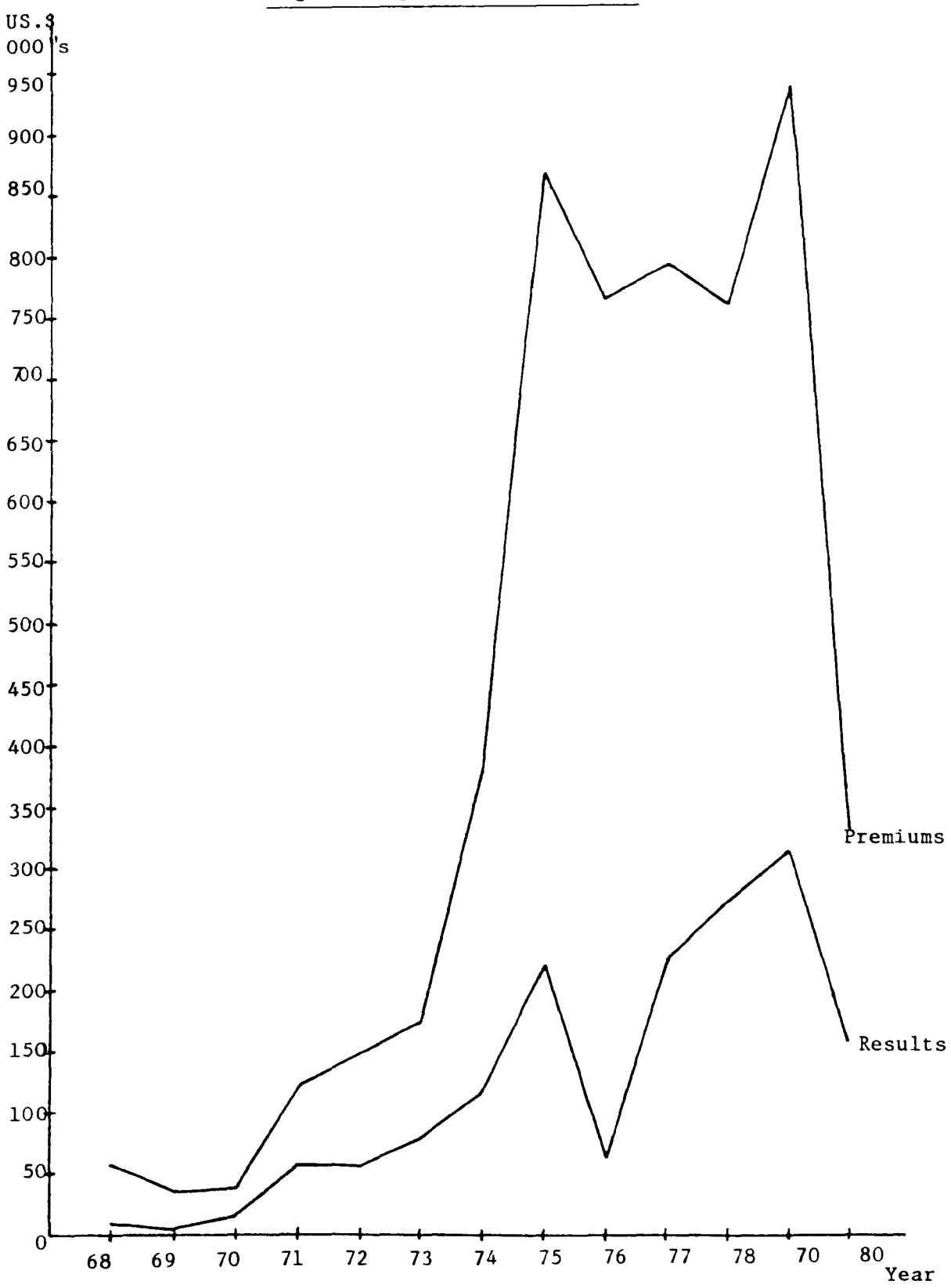
Source: The Iraq Reinsurance Co., the Report of October 1981.

Note: (1) Figures converted from I.D to US dollars on exchange rates - period average. Rates extracted from I.M.F. supplement on exchange rates, supplements Series No. 1, 1981.

(2) Each underwriting years figures are as at 31st December 1980.

Figure 7.1

Engineering Reinsurance Pool



The Aviation Pool

The aviation pool is probably more unbalanced than any of the other pools, due to the limited number of large exposure units. Table 7.4 and Figure 7.2 provide ample evidence of the fluctuations experienced in this class of business; premium income has dropped since 1974 in comparison with the previous years. It then reached

Table 7.4

Results of Aviation Pool
Underwriting Years (1968-80).

Currency: US $

Underwriting year	Premium income	Commission	Paid and o/s claims	Underwriting result profit(loss)	Result as % premium income
1968	104084	15155	108838	(19909)	(19.1)
1969	103551	15788	41801	45962	44.4
1970	1020245	196092	801918	22235	2.2
1971	1137103	239994	707406	189703	16.7
1972	1139786	205042	1078872	(144128)	(12.6)
1973	1055540	153522	774755	12763	12.1
1974	762523	114887	427383	220253	28.9
1975	662132	100319	233193	328620	49.6
1976	751321	113525	260270	377526	50.2
1977	1226692	189868	671999	364825	29.7
1978	953554	196129	572268	185157	19.4
1979	855896	125967	534342	195587	22.9
1980	714064	109010	401153	203901	28.6
	10486491	1775298	6614198	2096995	20.0

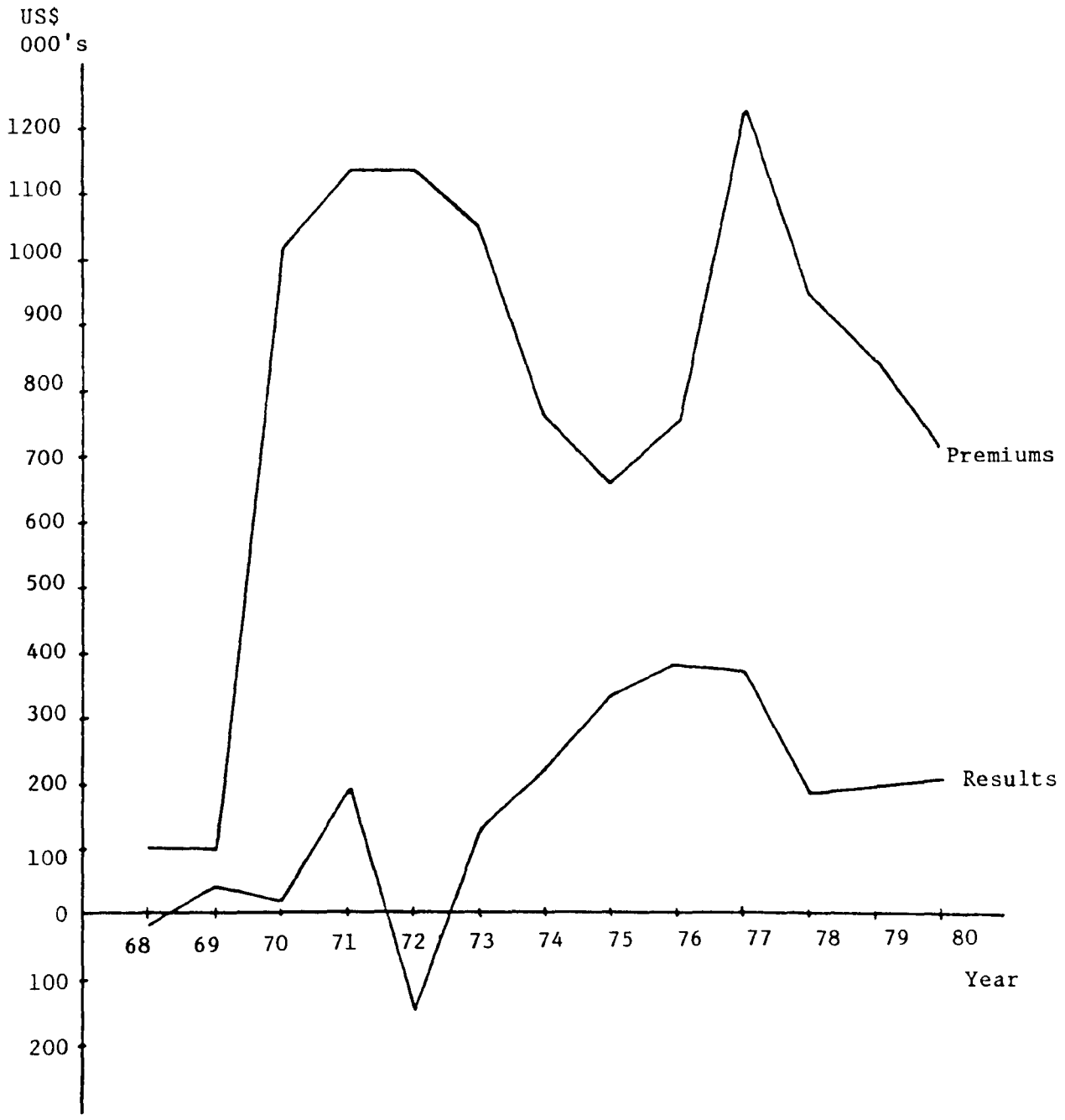
Source: (1) Misr Insurance Co. 1979 Annual Report.
(2) Societe Central de Reassurance, Morocco, 1980 Annual Report.

Note: (1) Each underwriting year's figures are as at 31st December 1980.

(2) The figures are net of excess of loss cover.

Figure 7.2

Aviation Reinsurance Pool



its highest level in 1977, followed by a further drop over the period 1978-1980. This was due to the positionof the international aviation market during the past seven years, when aviation rates fell dramatically. These reductions can be partly explained by the improvements in aircraft manufacturing and safety techniques, but the foremost factor is the intense competition due to over-capacity in the market. The obvious facts are that only twice (in 1968 and 1972) in the last 13 underwriting years has the pool suffered underwriting losses. Like the engineering pool, a substantial technical profit amounting to 19.6 percent of premiums was achieved for the period 1968-78. The figure rose slightly to 20.0 percent for the period 1968-80. However, especially in the case of the later underwriting years ,changes can be expected to the final profit ratios as the outstanding claims are run off.

The Fire Pool

During the period reviewed, it can be seen that despite premium income increasing rapidly, the size of the pool's business, compared with the total fire business of the members of the GAIF, was relatively small. This can be attributed to the fact that the average shares ceded to the pool were far below the pool's underwriting capacity, and to the pool's limited membership and capacity.

Table 7.5 and Figure 7.3 show that during the 1971-73 period, the pool achieved substantial profit. Since 1974 results have deteriorated, producing considerable losses, though in 1977 and 1978 the pool was involved in the three largest Arab fire losses, as follows:

-	April 1977	Umm Said-Qatar	US$ 76 million
-	May 1977	Abqaiq-S. Arabia	US$ 54.5 million
-	April 1978	Abqaiq-S. Arabia	US$ 53 million

Table 7.5

Results of Fire Pool
Underwriting Years (1971-80)

Currency: US $

Year	Premium income	Commission	Paid claims	Outstanding claims	Under-writing result, profit(loss)	Result as % premium income
1971	171904	68616	9165	3829	90294	52.5
1972	229721	101734	38404	4680	84903	37.0
1973	269620	129747	49447	37495	52931	19.6
1974	284762	134483	125349	103574	(78644)	(27.6)
1975	295088	130413	130365	111733	(77423)	(26.2)
1976	444535	213711	141573	94403	(5152)	(1.2)
1977	560677	265037	282144	275668	(262172)	(46.8)
1978	730631	336842	262886	355760	(224857)	(30.8)
1979	760875	325849	271148	171606	(7728)	(1.0)
1980 1st half	443892	197533	94693	179883	(28217)	(6.4)
	4191705	1903965	1405174	1338631	(456065)	(10.9)

Source: Societe Tunisienne d'Assurance et de Reassurance, 1980. Annual Report.

Note: (1) Each underwriting year's figures are as at 30th June 1980.

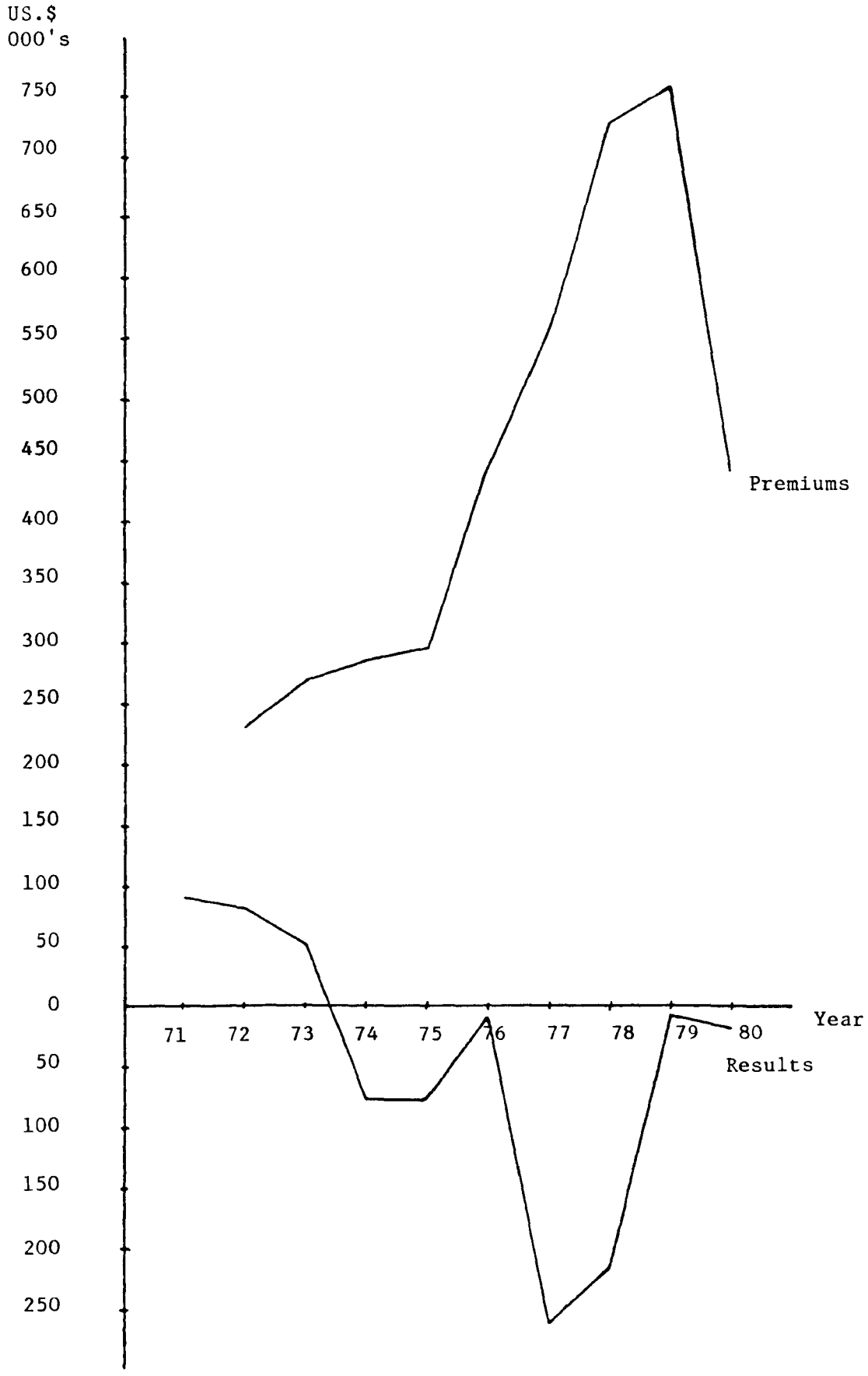
(2) The figures are net of excess of loss cover.

The Marine Cargo Pool

The pool's problems, which are similar to those in the other Arab reinsurance pools, are its limited capacity, the small size of shares ceded to the pool, and an inadequate number

Figure 7.3

Fire Reinsurance Pool



of members. Although the development programmes call for a variety of insurance covers, marine cargo insurance was the first beneficiary of the recent economic boom which has made it by far the largest branch of insurance in many Arab countries. This is why marine cargo business added weight to the importance of the establishment of the Arab marine cargo pool.

Although the premium income has risen dramatically during the period 1972-1979 (see Table 7.6 and Figure 7.4), with an average annual growth rate of 33.6 percent, the pool's position is not encouraging, because its business is still small and constitutes an insignificant share of the total marine premiums of the GAIF members. It would seem, therefore, that this pool has been even less successful than the other Arab pools in attaining its objectives of retaining as much as possible of the regions marine business.

During the period 1972-78 the pool achieved an overall loss of only US $58,325 (i.e. a somewhat modest 1.05 percent of premium income). Given the size of the outstanding claims, the international competition in marine business, and the substantial losses which have occurred since 1980 due to the war between Iran and Iraq, a progressive deterioration in the pool's results may be expected.

The Marine Hull Pool

The premium income of this pool has remained small (see Table 7.7) mainly because of the low retention limits of the member companies. They face two difficulties. First, only a small number of

Table 7.6

Results of Marine Cargo Pool - Underwriting Years (1972-79).

Currency: U.S.$

Underwriting year	Premium income	Received interest on reserves	Commission and other charges	paid claims	Outstanding claims	Underwriting result profit/loss	Result as % premium income
1972	184,502	1,950	82,189	112,899	2,837	(11,473)	(6.2)
1973	369,103	5,518	166,105	199,606	12,574	(3,664)	(1.0)
1974	837,410	10,085	381,423	447,721	49,615	(31,264)	(3.7)
1975	1,170,757	16,314	527,028	655,149	79,163	(74,269)	(6.3)
1976	940,548	14,762	444,232	434,111	115,350	(38,383	(4.1)
1977	999,043	9,677	506,478	368,348	124,450	9,444	0.9
1978	1,063,636	6,280	512,821	294,430	171,381	91,284	8.6
1979	1,399,912	-	689,269	92,701	339,892	278,050	19.9
	6,964,911	64,586	3,309,545	2,604,965	895,262	219,725	3.2

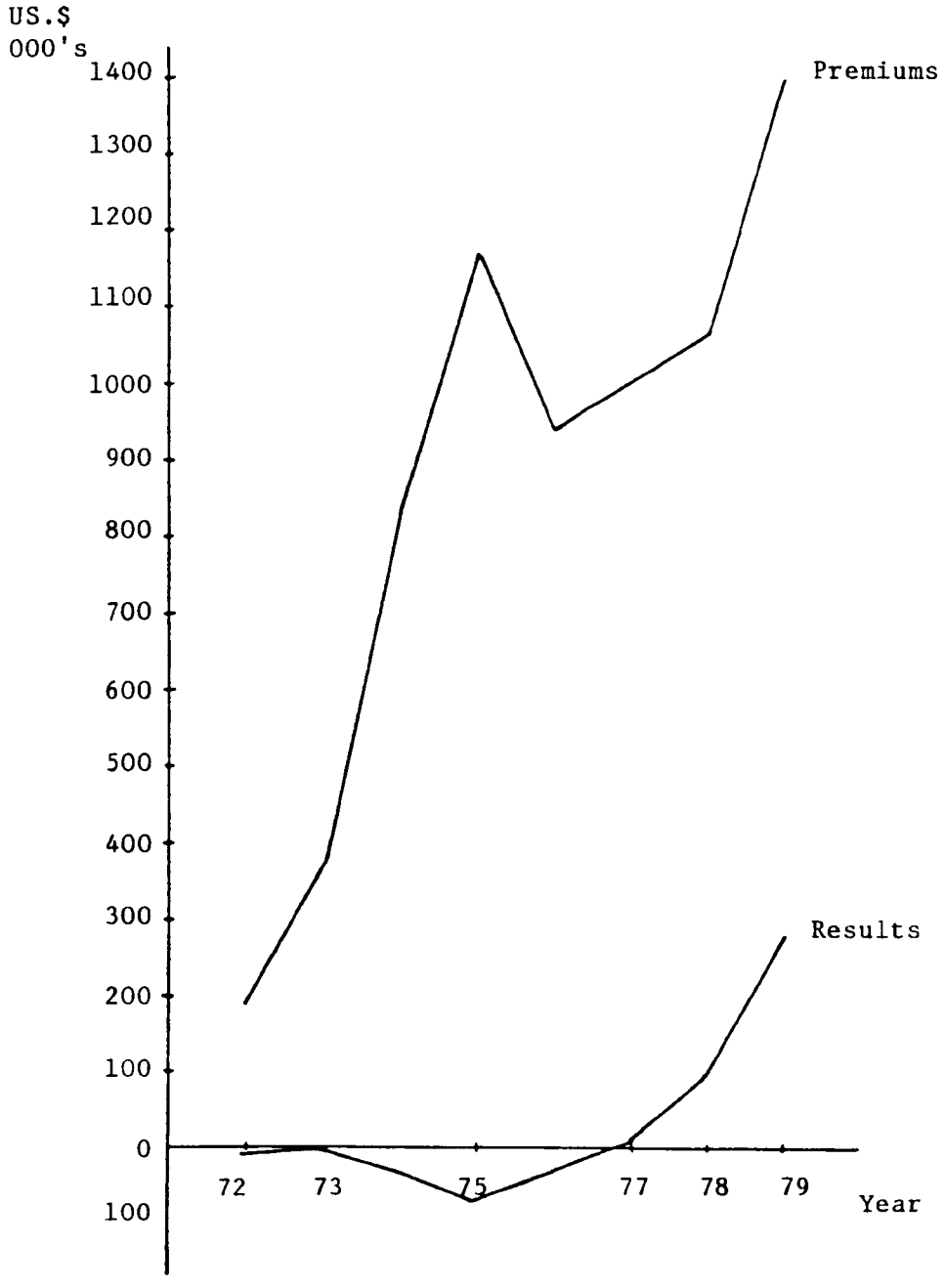
Source: Kuwait Insurance Co. The 1981 Annual Report.

Note: (1) Figures converted from K.D. to US dollars on exchange rates period average. Rates extract from I.M.F. supplement on exchange rates, supplements series No. 1.

(2) Each underwriting years figures are as at 31st December 1979.

Figure 7.4

Marine Cargo Reinsurance Pool



ships are insured in the Arab world, so that the companies' marine hull portfolios have remained unbalanced. Secondly, new vessels are larger and more sophisticated; consequently the companies have tended to err on the side of caution in fixing their retention limits.

Table 7.7

Results of Marine Hull Pool - Underwriting Years (1974-79)

Currency: US.$

Year	Premium income	Commission & other charges	paid claims	Out-standing claims	Results	Profit /Loss (%)
1974	24,825	9,635	263	11,354	3,573	14.4
1975	71,174	22,231	12,606	5,238	31,099	43.7
1976	81,862	23,717	37,091	23,514	(2,460)	(3.0)
1977	143,108	41,766	44,231	1,614	55,493	38.8
1978	121,210	40,201	43,329	50,478	(12,898)	(10.6)
1979	157,893	42,078	115,468	39,457	(39,110)	(24.8)
	600,072	253,088	131,659	179,628	35,697	5.9

Source: Societe Central de Reassurance, Morocco. The 1980 Annual Report.

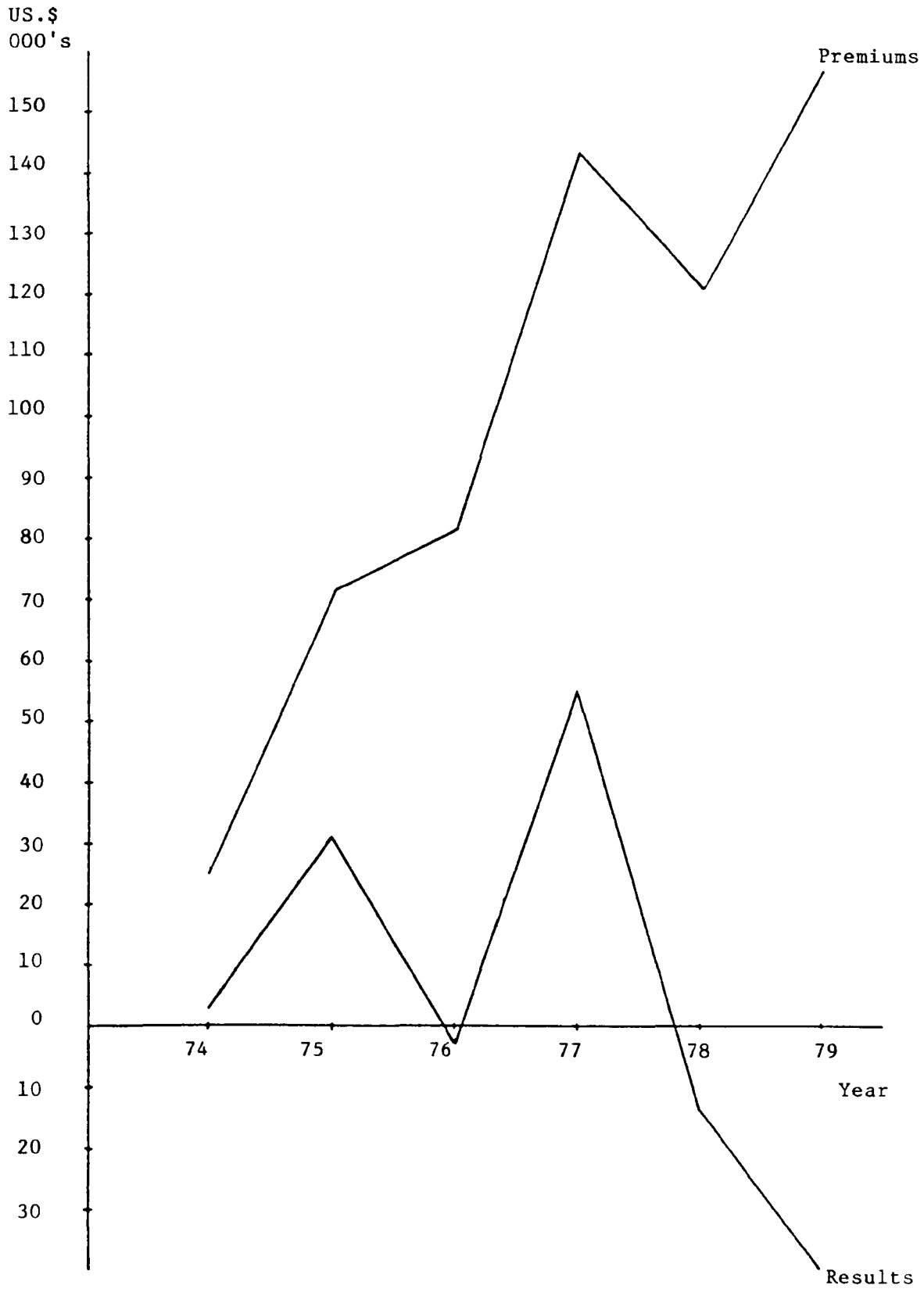
Note: (1) Figures converted from Moroccan Derham to US dollars on exchange rates period average. Rates extract from I.M.F. supplement on exchange rates, Supplement Series No. 1, 1981.

(2) Each underwriting year's figures are as at 31st December 1979.

By reason of the size of the overall portfolio underwritten, fluctuations in underwriting results may be expected, but the outcome of results for the last few years is not particularly encouraging, due to the considerable losses which have occurred in the Arab world.

Figure 7.5

Marine Hull Reinsurance Pool



7.2.4 Conclusions

One final comment on the Arab pools' experience is related to the main problems facing the pools' managing companies. Although the submission of accounts by member companies to the pools' managers are a matter agreed between both parties, the managers have always been (and still are) faced with undue delay in receiving ceding companies' accounts. Inevitably, therefore, the pools' results and annual reports are published very late. Settling balances due to the pools by some companies is another problem. Clearly any delay by the member companies in settling their accounts causes a shortage of liquidityand a loss of investment income. For example, the managing company of the fire pool has reported that some balances due to the pool since 1971 are still unsettled.

The performance of the pools as measured by the growth of their premium income has been disappointing, having failed to reflect the increasing premium income emanating from the region. The pools' aggregate premium income of US$4.119 million in 1979 represented only 2 per mille of the total premium income of 2037.4 m. for all Arab countries apart from Saudi Arabia, or 1.3 per mille, if Saudi Arabia's premium income is included. Thus the pools' contribution to increasing the premiums retained within the region has been minimal. Since the pools were first formed they have failed to adopt the right policies for increasing the retention capacity of the region, and now is the time for them to consider a radical solution by merging the five pools into one.

The creation of a single pool could provide a number of benefits, notably:

1. the new pool's administrative costs should be much lower than the combined costs of the present five pools;
2. it would be able to pick up the bouquet business from which the five pools, up to this time, have had to abstain;
3. it would provide a better basis for the acceptance of reciprocal business from abroad; and
4. provided it also adopted the policies listed below, the pool ought to be able to retain a larger volume of local premium income within the Arab region, and achieve more stable underwriting results.

In order to achieve the largest possible increase in the new combined pool's retained premium income a number of other measures would be necessary; notably:

1. The pool should accept all classes of non-life business.
2. It should have higher underwriting limits than the existing pools. In order to safeguard the interests of the pool's members and to reduce their liabilities from accumulation risks, the pool's managing company would need to arrange excess of loss cover for common account.
3. The pool's geographical scope should be worldwide.
4. Each member should be required to cede to the pool a minimum amount of premium as a condition of membership.
5. All the members (except reinsurers) who accept business from the pool should be required also to cede business to it.

If the present members of the Arab pools and other Arab insurers are not prepared to take such steps to improve their effectiveness, then it would be better to abolish the pools which currently seem to create more problems than they solve.

7.3 The Formation of Arab Reinsurance Companies

The last twenty years have witnessed both an unprecedented rate of formation of professional reinsurance companies worldwide, and an increase in the importance of reinsurance, as will be shown in this chapter and Chapter eight.

In the Arab world government intervention in insurance business has extended to reinsurance and, as described in Chapter three, this has led to the formation of a growing number of professional reinsurance companies. These companies are of two types:

1. National reinsurance companies:
   - (a) Egyptian Reinsurance Company, Egypt. (State owned).
   - (b) Iraq Reinsurance, Iraq. (State owned).
   - (c) Societé Central de Reassurance, Morocco. (Majority state owned).
   - (d) Kuwait Reinsurance Company, Kuwait. (Privately owned).
   - (e) National Reinsurance Company , Sudan. (State and privately owned).
   - (f) Compagnie Central de Reassurance, Algeria. (State owned).
   - (g) Societe Tunisienne de Reassurance, Tunisia. (State and privately owned).
2. Regional insurance companies:

(a) Arab Reinsurance Company, Beirut (State and privately owned).

(b) Arab Union Reinsurance Company, Damascus (State owned).

(c) Mediterranean Insurance and Reinsurance Company, London (State owned).

(d) Arab Insurance Group (ARIG), Bahrain (State owned).

The establishment of these reinsurance companies marked a considerable change in the reinsurance arrangements of the markets concerned. Prior to their formation, most reinsurance business was placed with foreign reinsurers. The main reasons for setting up the Arab reinsurance companies were:

(i) to increase the premium retained and consequently partly reduce the amount of business leaving the country/region;

(ii) to reduce the dependence upon foreign reinsurers;

(iii) to reduce the outflow of foreign currency at country and regional levels; and

(iv) to write international reinsurance business to provide a two-way flow of business with the rest of the world.

The national Arab reinsurance companies are given the right to receive compulsory (i.e. quota shares of all business written as in Algeria, Egypt, Iraq, Kuwait, Morocco, Sudan and Tunisia) reinsurance cessions from the direct insurance companies on advantageous terms. The percentages of compulsory cessions vary from 10 per cent in Morocco to 30 per cent in Egypt. Carter (1980, pp.65-66) has discussed the compulsory cessions placed with the Egyptian Re and pointed out that 'arguably' the taking of compulsory cessions on less generous terms to its ceding companies than are available

on the foreign reinsurance market is the only way that the new reinsurance company could withstand competition from foreign reinsurers, acquire a widespread portfolio of business and thereby:

"(a) retain for its own account a significant proportion of its total gross premium income, so reducing the country's imports of reinsurance;

(b) offer the balance in exchange for overseas reinsurance so as to obtain a geographically diversified portfolio of business; and

(c) rapidly build-up its free reserves to finance larger retentions and so further increase its business".

Such benefits to the reinsurer are, however, obtained at the expense of its ceding companies or their policyholders, who are obliged to pay higher premiums to cover the higher reinsurance costs incurred by their insurers.

Besides receiving compulsory quota share cessions, national reinsurance companies have also participated in the direct writing companies' reinsurance treaties. For example, Moroccan insurers have been called upon by the supervisory authority to let the Societe Central de Reassurance particpate in up to 50 percent of their reinsurance treaties. Iraq Reinsurance Company receives the following shares of the National Insurance Company's reinsurance treaties:

Reinsurance Treaties	Range of Share Accepted	Period Considered
Accident Q.Share& XL treaties	30% - 51%	1970-1980
Marine Q.Share & surplus treaties	30% - 48%	1971-1980
Hull Q. share & surplus treaties	30% - 48%	1971-1980
Fire Q. share & surplus treaties	40% - 48%	1975-1980

Source: The Iraq Reinsurance Company.

Other Arab national reinsurance companies are also offered

a share of the ceding companies' reinsurance treaties. This share varies from class to class, and from country to country. Thus the Arab national reinsurers through their participation in both compulsory and voluntary reinsurance treaties obtain a considerable percentage of their markets' total volume of reinsurance, but then they retrocede a part of it abroad.

Regional developments have also led to the increase of retention within the Arab region of some reinsurance business that otherwise would have been ceded to international markets. Arrangements have been made for regional reinsurance companies (except ARIG) to receive compulsory shares in reinsurance business arranged by Arab insurers and reinsurers. Under the terms of the agreement establishing a regional reinsurer, each shareholder has to cede a certain share of its business to the reinsurer. An overall picture of the compulsory reinsurance cessions to the Arab regional reinsurers is given below:

1. Arab Reinsurance Company shareholders cede 5 per cent of their reinsurance treaties to the company on original treaty terms.
2. Arab Union Reinsurance Company: the company receives compulsory cessions of 10 per cent from all the direct insurance offices transacting business within the Libyan and Syrian insurance markets.
3. Mediterranean Insurance and Reinsurance Company: the company is equally owned by the Libya Insurance Company of Libya and the Compagnie Central de Reassurance of Algeria.

and each cedes 25 per centof their domestic reinsurance treaties. Establishing Mediterranean Re in the London market represents a completely new idea, particularly as the company is drawn from countries with such different backgrounds to the traditional London market.

African States belonging to the Organisation for African Unity have established the African Reinsurance Corporation with the same aim of increasing the amount of business retained in Africa. The Corporation commenced its operations in January 1978 with headquarters at Lagos, Nigeria. Under the terms of the agreement establishing the corporation, each member government requires every insurer to cede a minimum of 5 per cent of all reinsurance treaties placed outside the country. The corporation's eight Arab members are: Algeria, Egypt, Libya, Mauritania, Morocco, Somalia, Sudan, and Tunisia.

The formation in Bahrain of the Arab Insurance Group in 1980 by the governments of Kuwait, Libya and U.A.E. marked a further significant step towards increasing the proportion of total domestic premiums retained within the region. The size of its capitalisation (US$3 billion authorised capital with US $150 million paid-up) made it the strongest new entrant to the international insurance market, and it was reported by UNCTAD (1982, p. 29) that it wrote US $ 80 million of premium income in its first eight months of operation to December 1980. In 1982 68 percent of its premium income was received from non-Arab countries (Financial Times, 1983). The company is recruiting experienced London underwriters and in due course expects to be in a position to take the lead on major risks.

Besides participating in direct insurers' treaty reinsurances, the national and regionalreinsurers also accept shares of facultative reinsurances too. However the problem remains that the underwriting capacities of the Arab reinsurers is still very small in relation to the size of risks requiring insurance. Consequently not only are the direct insurers obliged to place substantial reinsurances abroad but the nationaland regional reinsurers also find it necessary to retrocede to foreign reinsurers a significant proportion of the reinsurances they have accepted. Obviously those retrocession arrangements vary both by class of insurance and between companies. Figure 7.6 presents a simple chart of the reinsurance flow within the Arab region and its links with the international market.

Reinsurance Premiums Accepted from, and Ceded Abroad by, Arab Reinsurers.

It has proved impossible to establish precisely what contribution the formation of Arab reinsurers has made to increasing the retention capacity of the countries concerned. However, Table 7.8 does record the increase in the gross written and retained premium income of some of the Arab reinsurers during the period 1967-1979. In 1979 the companies' retained premiums varied between about 20 percent and 63 per cent of their gross written premiums with an overall average of 56.2 per cent. The drop in the percentages of retained premiums in the later years was caused mainly by the increase in the number of large risks and the low retentions of the newly established reinsurers.

Unfortunately the lack of adequate statistics for all of the Arab reinsurers prevent a complete evaluation of the role of Arab

Figure 7.6

Reinsurance Flow within the Arab World and its Links with the International Market

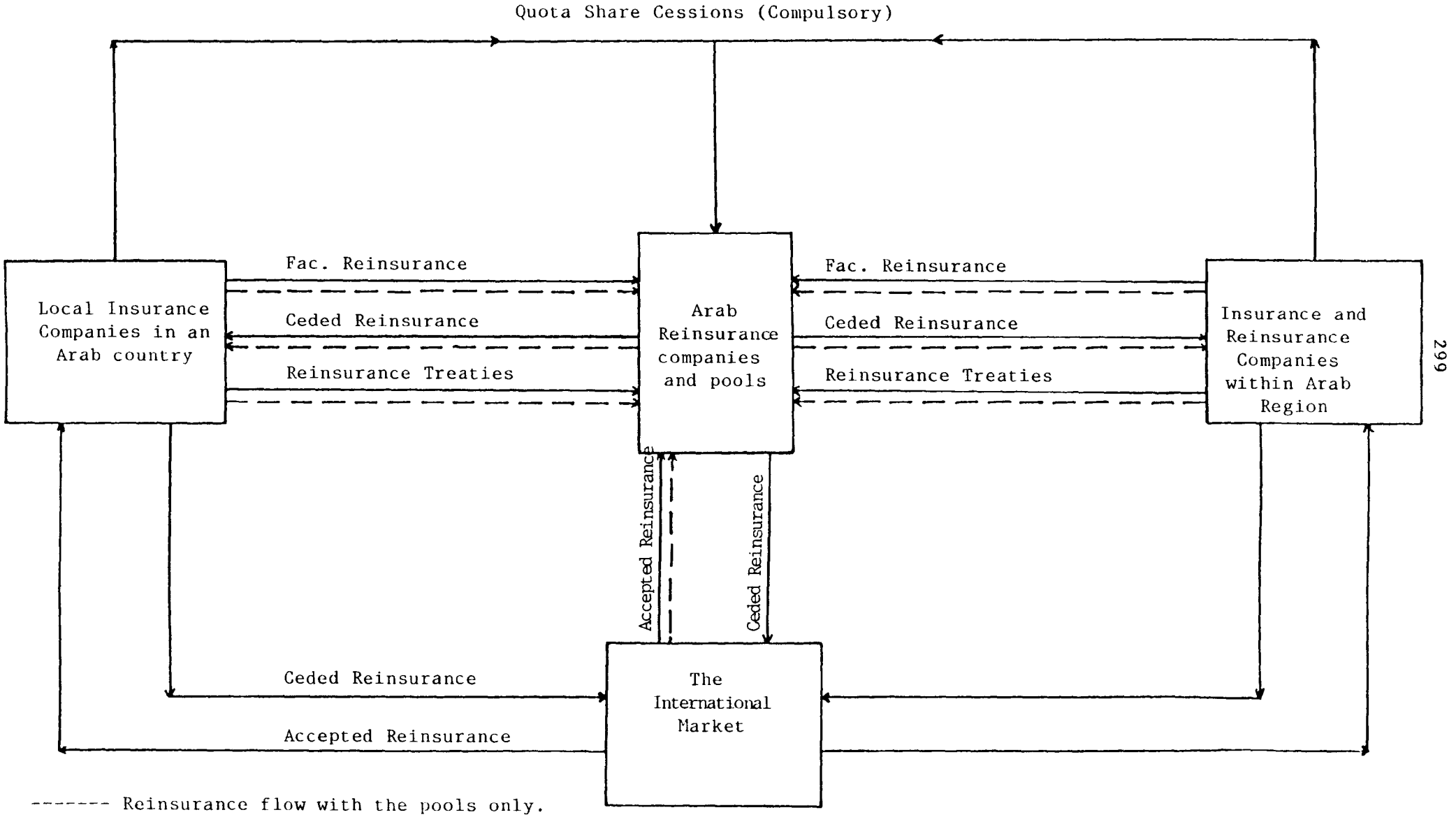


Table 7.8

Development of Written and Retained Premium
by Arab Reinsurers
(U $ million)

	1967	1977	1978	1979
Gross premium	24.975	271.654	317.838	377.895
Net Retained premium	16.717	167.518	191.111	212.276
Retention %	66.9	61.7	60.1	56.2

Source: Ridha (1981, p.2).

Note: Figures for 1967 include only three reinsurance companies, while figures for 1977-79 include nine companies.

reinsurers in increasing the retention capacity of individual countries and of the region as a whole. Therefore, two companies the Egypt Re and Iraq Re, are selected as case studies not only because they are the oldest reinsurers in the Arab world, but also because there is relatively full data available on them, allowing for a detailed study of their development.

Egypt Reinsurance Company

The Egypt Reinsurance company began its reinsurance dealings with a very small portfolio acquired from the local market, mainly through compulsory cessions. In its first year of operation (1958) the company's total premium received was £E 1.057 million, of which £E 739 thousand (i.e. 69.9

per cent was retained by the company. By 1981/82 gross premium income amounted to £E87.033 million, of which £E53.531 million (i.e. 61.5 per cent)was retained. Over the period 1958-1981/82 the growth rate of gross premium income was 20.2 per centp.a., while premiums retained grew at an average rate of 19.5 per cent. Table 7.9 shows the growth of non-life reinsurance premium received by the company from home and abroad for the period 1970/71 - 1981/82.

One of the most important objectives of any reinsurance company in the Third World is to offset the outflow of reinsurance premiums abroad. Unfortunately, although the company publishes breakdowns of its premiums both between domestic and foreign business and between gross and retained premiums, it does not separate premiums retroceded between the Egyptian direct insurers and foreign reinsurers. Therefore it is not possible to obtain a precise measure of the balance between premiums retroceded to and received from foreign insurers and reinsurers. Nevertheless it is possible to obtain some measures of its success in achieving that objective.

First, the proportion of inwards foreign premiums to total gross premiums increased from 25.4 percent in 1970/71 to 32.4 percent in 1981/82 (see Table 7.9). Whereas over that period domestic gross premiums increased at an average annual rate of 22.2 percent, foreign business grew at a rate of 26.0 percent.

Secondly, over the period 1975 to 1981/82 the company received from abroad premiums totalling £E107.664 million compared with total premiums retroceded to domestic and foreign insurers of £E114.715 million (see Table 7.10).

During the same period there was little change in the propor-

Table 7.9

Development of Non-Life Premium Income of the Egyptian Reinsurance Co.
(£E million)

Source of business	1970/71 Gross premiums	1970/71 % of total gross premiums	1976 Gross premiums	1976 % of total gross premiums	1981/82 Gross premiums	1981/82 % of total gross premiums
Compulsory cessions	5.746	66.5	11.777	58.8	46.771	54.2
Non-compulsory domestic	0.695	8.0	1.534	7.7	11.562	13.4
Inwards foreign business	2.196	25.4	6.733	33.6	27.974	32.4
Total	8.637	100.0	20.044	100.0	86.307	100.0

Source: extracted from the Egyptian Re's annual reports and the E.G.I.O.

Note: prior to 1973 and from 1980 onwards the company's financial year commenced on 1st July: during the period 1973 to 1980 its financial year commenced on 1st January.

Table 7.10

Life and Non-Life Reinsurance Premiums Handled by Egypt Reinsurance Co. (£E million)

Year	Domestic Business			Foreign Business			Total Business		
	Premiums	Retention	%	Premiums	Retention	%	Premiums	Retention	%
1970/71	-	-	-	-	-	-	8.694	4.841	55.7
1975	12.204	6.909	56.6	5.071	3.808	75.1	17.275	10.717	62.0
1976	13.447	7.667	57.0	6.733	5.072	75.3	20.180	12.739	63.1
1977	15.399	8.954	58.1	8.049	5.888	73.2	23.448	14.842	63.3
1978	19.983	11.867	59.4	11.048	8.257	74.7	31.031	20.124	64.9
1979	30.761	16.927	55.0	22.578	16.633	73.7	53.339	33.560	62.9
1980/1981	49.467	27.991	56.6	26.203	19.757	75.4	75.670	47.748	63.1
1981/1982	59.051	32.153	54.4	27.982	21.378	76.4	87.033	53.531	61.5
	200.312	112.468	56.1	107.664	80.793	75.0	316.670	198.102	62.6

Source: Extracted from the Egyptian Re's annual reports and the E.G.I.O.

Note: Due to the change in the financial year, figures for the period from 1st January to 30th June 1980 have been omitted.

tions of domestic and foreign premiums retained by the company. No doubt the increase in the amount of domestic business written by the company has resulted in an increase in the absolute values of domestic premiums ceded abroad. However, those retrocessions could have served two main objectives:

(i) to relieve the company from what may exceed its retention capacity, and

(ii) to provide it with more inwards reinsurance business through reciprocity.

The balance of inwards compared with outwards premiums is, however, only a partial measure of success. More important is the balance of the operating results (i.e. underwriting result plus investment income) of the inwards and outwards business.

Carter pointed out in his study of the Egyptian market, that it is not possible to obtain information about the quality of the inwards foreign reinsurance business obtained by the Egyptian Re, and the profitability of that business, compared with domestic reinsurances it ceded abroad. The only information available relates to the gross underwriting losses of domestic and foreign reinsurance business received by the company in 1980/81 and 1981/82 as shown in Table 7.11. This table shows that overall the company (like many other reinsurers during the same period) has incurred serious underwriting losses, with a loss in 1981/82 of 8 per cent of total reinsurance premiums written compared with a 15.4 per cent of total premiums in 1980/81.(1) According to Egypt Re, much of the local

(1) Information about what were the results of the company's retrocession treaties is not available.

Table 7.11

Underwriting Results of the Egyptian Reinsurance Co.

Year	Gross Underwriting Losses				Total Losses Total premiums
	Local (£E m)	% of local premium	Foreign (£E m)	%of foreign premium	
1980/81	8.951	18.1	2.687	10.3	15.4
1981/82	5.598	9.5	1.399	5.0	8.0

Source: Extracted from the Egyptian Re's annual reports.

underwriting loss is attributed to the very poor marine cargo and motor T.P.L. results, while the aviation and marine hull played their parts in the foreign underwriting loss. Its foreign business results were better than for domestic business,though no meaningful conclusions can be drawn from just two years.

The profitability of the Egyptian Re's total business during the period 1975-1981/82 is shown in Table 7.12 and Figure 7.7. The company's underwriting loss has increased dramatically in recent years, advancing from 4.37 percent on net premium income in 1975 to 7.72 percent by 1981/82. While investment income continues to grow (10.55 percent on net premium in 1981/82 compared with 8.25 percent in 1975), the net profit left appears to be uncomfortably narrow. A possible explanation lies partly in the bad underwriting results of foreign and domestic business, partly in the effect of economic fluctuations, and partly in the rapid expansion of worldwide over-capacity in the last few years.

The Egyptian Re is not unusual in producing underwriting losses, these are common for most professional reinsurers throughout

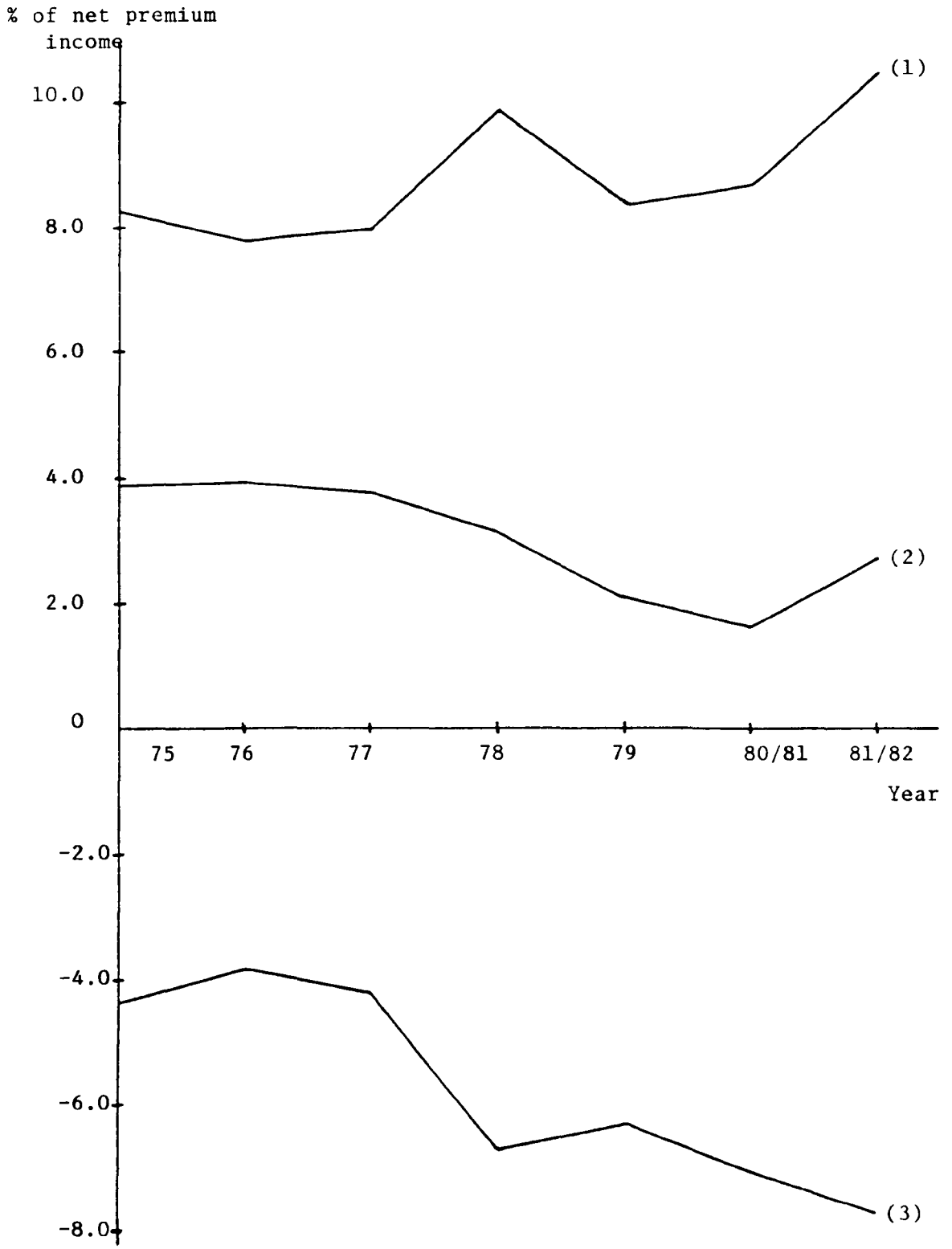
Table 7.12

Profitability of the Egyptian Reinsurance Company

	1975	1976	1977	1978	1979	1980/81	1981/82
	£E000's	£E000's	£E000's	£E000's	£E000's	£E000's	£E000's
(a) Net premium income	10.717	12.739	14.842	20.124	33.560	47.748	53.531
(b) Underwriting loss	(468)	(489)	(624)	(1.362)	(2.108)	(3.385)	(4.134)
(c) Net investment profit	884	994	1.190	1.994	2.823	4.189	5.647
(d) Net profit (c-b)	416	505	566	632	715	804	1.513
Profit ratios:							
$\frac{b}{a}$ x 100	- 4.37%	- 3.84%	- 4.2%	- 6.77%	- 6.28%	- 7.09%	- 7.72%
$\frac{c}{a}$ x 100	8.25%	7.80%	8.0%	9.91%	8.41%	8.77%	10.55%
$\frac{d}{a}$ x 100	3.88%	3.96%	3.81%	3.14%	2.12%	1.68%	2.83%

Source: compiled from the Egyptian Re's annual reports and the E.G.I.O.

Figure 7.7
Profitability of the Egyptian Reinsurance Company



(1) = $\frac{\text{Net investment profit}}{\text{Net premium income}}$ x 100

(2) = $\frac{\text{Net profit}}{\text{Net premium income}}$ x 100

(3) = $\frac{\text{Underwriting Loss}}{\text{Net premium income}}$ x 100

the world. In the U.S., 30 professional reinsurers (or 75 percent) out of 40 have achieved underwriting losses for a 5-year average from 1976-1980 (Lambert, 1982). This number rose to 42 reinsurers (out of 50) in 1981 and 46 in 1982 (Stockes, 1983). The U.K. non-life reinsurance companies also suffered badly from underwriting losses. The underwriting loss increased dramatically in 1982, except for the Victory which ended the year with a lower underwriting loss than in 1981 (as shown in Table 7.13). Other major professional reinsurers like Munich Re, Swiss Re etc., have also achieved underwriting losses in the last few years.

Table 7.13

Underwriting Results of the U.K. Non-Life Reinsurance Business (1980-1982)

	Premium Written			Underwriting Result		
	1980 £m	1981 £m	1982 £m	1980 £m	1981 £m	1982 £m
Commercial Union (London market)	n.a	34.3	41.3	n.a	- 3.5	- 3.8
Royal Re	43.1	48.1	59.9	0.2	- 1.6	- 4.4
Sun Alliance & London	39.7	33.9	45.7	- 2.9	- 4.9	-14.2
Prudential(M&G)	153.4	174.4	203.7	-12.4	-23.8	-31.9
Eagle Star (London market)	n.a	n.a	n.a	0.2	- 0.5	- 5.7
Phoenix (London Guarantee)	15.7	20.8	22.7	- 0.8	- 1.6	- 3.7
Legal & General (Victory)	34.7	50.4	53.9	- 3.1	- 8.9	- 7.7

Source: Carter and Godden (1983/84, p. 72).

Iraq Reinsurance Company

Like the Egyptian Re, Iraq Reinsurance Company has played a significant role in enhancing local retention capacity and hence in reducing the reinsurance ceded abroad. The company's gross premium income has risen from ID 307,000 in its first year of operation (1961), to ID. 4.022 million in 1970, and to ID 53.315 million in 1980 with an average annual growth rate of 31.2 per cent during the period 1961-1980.

A newly established reinsurance company in any developing country cannot hope to build up immediately a sizeable foreign portfolio, and during its first few years the company's business and particularly its foreign business was very small. However, in the late 1960's the company resolved to expand its foreign business; growth was so rapid that during the period 1970-1973 inwards foreign business exceeded its total domestic business (see Table 7.14).

Despite the fact that the company's overseas reinsurance premium income was considerably increased during the period 1971-80, after 1973 it failed to keep pace with the growth of domestic business. Over the period 1971-80, compulsory cessions grew at an average annual rate of 36.1 per cent while the growth rate of non-compulsory cessions was 35.7 per cent. The inwards foreign premiums increased at an average rate of 16.4 per cent.

Table 7.15 shows the geographical distribution of the company's inwards foreign reinsurance premiums. During the period 1971-1980 there was a significant increase in the shares of both Afro-Asian and Arab countries' business in the total portfolio, with the share of other countries falling from around 50 per centat the beginning

Table 7.14

Development of Total Premium Income of Iraq Reinsurance Company (ID.million)

Year	Compulsory cessions		Non-compulsory Domestic		Inwards Foreign Business		Total premiums
	Gross premiums	% of total gross premiums	Gross premiums	% of total gross premiums	Gross premiums	% of total gross premiums	
1971	1.890	33.4	0.700	12.4	3.069	54.2	5.659
1972	2.020	31.8	0.750	11.8	3.583	56.4	6.353
1973	2.610	34.1	1.079	14.1	3.964	51.8	7.653
1974	5.864	45.3	2.453	19.0	4.621	35.7	12.938
1975	9.153	43.1	5.180	24.4	6.893	32.5	21.226
1976	10.910	45.2	4.962	20.6	8.244	34.2	24.116
1977	11.487	40.5	6.263	22.1	10.640	37.4	28.390
1978	13.171	44.3	5.052	17.0	11.512	38.7	29.735
1979	22.926	46.0	14.801	29.7	12.111	24.3	49.838
1980	30.303	56.8	10.948	20.6	12.064	22.6	53.315

Source: Extracted from the Iraq Re's Annual Reports.

Note: In 1970 total premium income received by the company was ID 4.022 millon, of which ID. 1.947 million from the home market and ID.2.075 million from the foreign market.

of the period to under 40 per centby the end. The rise in the proportion of total business received from other Arab countries during the 1970s is attributable to:

(i) the company's efforts to develop its business relations with these markets, and

(ii) the general trend of direct premium income expansion in Arab countries as a result of their economic development.

Table 7.15

The Geographical Distribution of Reinsurance Premiums received by the Iraq Reinsurance Company from Abroad.

Year	% of total premium Arab countries	other Afro -Asian	Total Asia & Africa	% of total premium Other regions	Grand total
1971	31.3	18.1	49.4	50.6	100.0
1972	31.1	19.6	50.7	49.3	100.0
1973	24.0	29.5	53.5	46.5	100.0
1974	33.5	26.7	60.2	39.8	100.0
1975	35.5	23.3	58.8	41.2	100.0
1976	35.9	23.7	59.6	40.4	100.0
1977	36.9	23.5	60.4	39.6	100.0
1978	38.4	23.6	62.0	38.0	100.0
1979	39.5	23.1	62.6	37.4	100.0
1980	38.7	23.0	61.7	38.3	100.0

Source: Extracted from the Iraq Re's Annual Reports.

Besides the growth of domestic and foreign reinsurance premium income, the ability of the company to increase the country's retention capacity can be regarded as another measure of its success. Table 7.16 shows reinsurance premium retained by the Iraq Re for the period 1971-1980. In a span of nine years, the premium income retained by the company has increased almost nine-fold. The propor-

Table 7.16

Total Reinsurance Premiums handled by Iraq Reinsurance Company (ID million)

Year	Domestic Business			Foreign Business			Total Business		
	Premiums	Retention	%	Premiums	Retention	%	Premiums	Retention	%
1971	-	-	-	-	-	-	5.659	4.073	72.0
1972	-	-	-	-	-	-	6.353	4.575	72.0
1973	3.689	2.205	59.8	3.964	3.083	77.8	7.653	5.288	69.1
1974	8.317	5.551	66.7	4.621	3.626	78.5	12.938	9.177	70.9
1975	14.333	9.875	68.9	6.893	5.397	78.3	21.226	15.272	71.9
1976	15.872	11.006	69.3	8.244	6.420	77.9	24.116	17.426	72.3
1977	17.750	12.180	68.6	10.640	8.122	76.3	28.390	20.302	71.5
1978	18.223	12.548	68.9	11.512	8.533	74.1	29.735	21.081	70.9
1979	37.727	22.014	58.4	12.111	8.309	68.6	49.838	30.323	60.8
1980	41.251	26.317	63.8	12.064	8.813	73.0	53.315	35.130	65.9
Total	157.162	101.696	64.7	70.049	52.303	74.7	239.223	162.647	68.0

Source: Extracted from the Iraq Re's Annual Reports.

tion of total business retained was consistently around 70 percent until 1979, when it dropped ten percentage points due to its domestic premium income having doubled in the one year. As a result of that increase the proportion of domestic premiums it was able to retain fell from 68.9 to 58.4 per cent.

Throughout the period the company has retained a higher proportion of its inwards foreign business than domestic business. This has been possible because of the better risk distribution and so more balanced portfolio of business it obtains from abroad than from its domestic market.At home it is required by law to take a 25 per centquota share of every insurance written by the National Insurance Company, plus various shares of non-compulsory treaties. Therefore its domestic business is more heavily exposed to both industrial large losses and accumulations of losses from natural hazards and other events.

Regarding the company's profit performance, as can be seen from Table 7.17 and Figure 7.8 it earned an underwriting profit on its total retained business each year from 1971-80 with the sole exception of 1977. Although the rate of underwriting profit has declined, it is still a far better performance than most professional reinsurance companies world-wide. On the other hand, for the reasons discussed in Chapter four, its investment income is relatively low compared with that of international reinsurers.

Table 7.18 shows that the favourable underwriting performance of the company over the last six years is entirely due to its domestic business. Each year since 1976 it has incurred underwriting losses on its foreign business, the deterioration in results follow-

Table 7.17

Profitability of the Iraq Reinsurance Company

	1971 ID000's	1972 ID000's	1973 ID000's	1974 ID000's	1975 ID000's	1976 ID000's	1977 ID000's	1978 ID000's	1979 ID000's	1980 ID000's
(a) Net premium income	4,073	4,575	5,288	9,177	15,272	17,426	20,302	21,081	30,323	35,130
(b) Underwriting profit	68	97	110	172	355	357	(570)	280	76	277
(c) Net investment profit	101	130	200	226	394	588	842	866	1.336	1.685
(d) Net profit (b+c)	169	227	310	398	749	945	272	1.146	1.412	1.912
Profit ratios:										
$\frac{b}{a} \times 100$	1.7%	2.1%	2.1%	1.9%	2.3%	2.0%	-2.8%	1.3%	0.3%	0.6%
$\frac{c}{a} \times 100$	2.5%	2.8%	3.8%	2.4%	2.6%	3.4%	4.1%	4.1%	4.4%	4.8%
$\frac{d}{a} \times 100$	4.2%	4.9%	5.9%	4.3%	4.9%	5.4%	1.3%	5.4%	4.7%	5.4%

Source: Extracted from the Iraq Re's Annual Reports.

Table 7.18

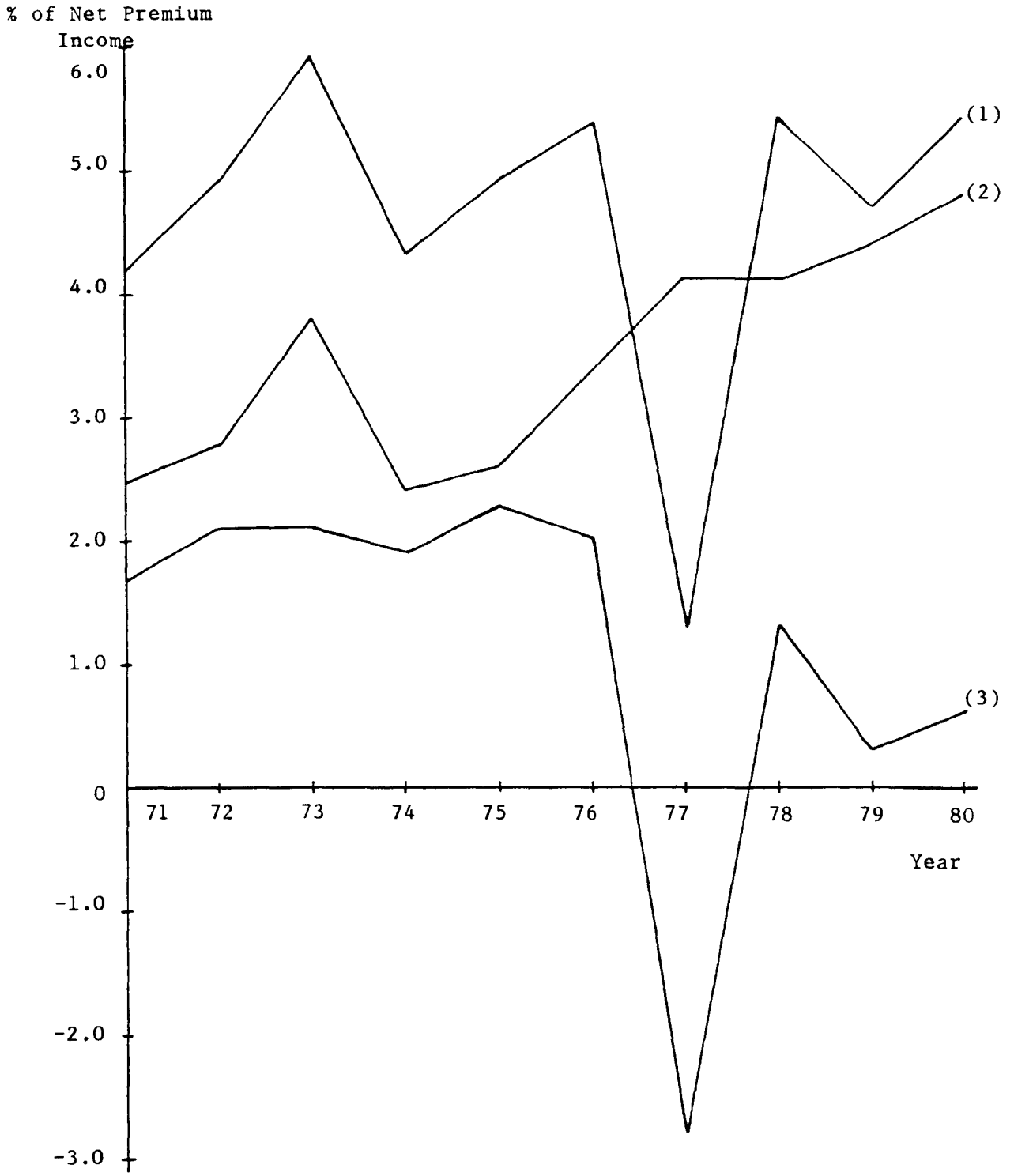
Underwriting Results of the Iraq Reinsurance Company

Year	Domestic Business			Foreign Business		
	Retained premiums	Underwriting profit/loss	%	Retained premiums	Underwriting profit/loss	%
	ID000's	ID000's		ID000's	ID000's	
1975	9,875	214	2.2	5,397	141	2.6
1976	11,006	695	6.3	6,420	(338)	- 5.3
1977	12,180	(197)	- 1.6	8,122	(373)	- 4.6
1978	12,548	725	5.8	8,533	(445)	- 5.2
1979	22,014	701	3.2	8,309	(625)	- 7.5
1980	26,317	1,329	5.1	8,813	(1,102)	-12.5

Source: Extracted from the Iraq Re's Annual Reports.

Figure 7.8

Profitability of the Iraq Reinsurance Company



(1) = $\frac{\text{Net profit}}{\text{Net premium income}} \times 100$

(2) = $\frac{\text{Net investment profit}}{\text{Net premium income}} \times 100$

(3) = $\frac{\text{Underwriting profit}}{\text{Net premium income}} \times 100$

ing the general pattern of international markets. Although it would be dangerous to draw any firm conclusions from just six years figures, if unprofitable foreign business is obtained in exchange for profitable local business retroceded abroad, it would have a double negative effect on the Iraq's balance of payments. On the other hand information is not available regarding the terms on which the Iraq Re has been able to place its retrocessions (e.g. commission and profit commission, etc.). Also to some extent annual underwriting profits/losses are the direct consequence of a company's management decisions. For example, changes in claims reserving policy can result in the rolling forwards or backwards of underwriting profits or losses. In Iraq Re's case during the period 1975-80 while retained premium little more than doubled (see Table 7.16), its technical reserves were increased from ID 14.576 million to ID 40.215 million. It is not known whether that was the result of any change in reserving policy or a deteriorating claims position, or whether there was any differential treatment of domestic versus foreign business.

Other Aspects of the Companies' Performance.

Although the Arab reinsurance companies have helped to reduce the amount of premium income ceded abroad two further questions must be answered before firm conclusions can be drawn regarding their contributions to their countries' economies. First, have they improved their countries' net foreign cash flow on reinsurance trade? Secondly, are these companies nationally and internationally acceptable as reinsurance carriers?

An attempt will be made to answer the first question in the following chapter dealing with the balance of payments effects of insurance and reinsurance trade with other countries.

As regards the second question, there would appear to be no reason why an Arab reinsurance company should not be acceptable to both local and foreign ceding companies provided it can fulfil the following conditions:

1. It must have sufficient capital resources to provide adequate security for its ceding companies. So far as is known, none of the Arab reinsurance companies have defaulted on their commitments or become party to a financial dispute with any insurer.
2. It must be free from exchange control restrictions. From the outset all of the Arab reinsurance companies have enjoyed such freedom.
3. It must establish a good communications network. Some Arab reinsurers, as a part of their strategy, have a considerable number of people touring the world, developing contacts with the ceding companies. In addition, seven out of ten national and regional reinsurance companies, (1) have established a 'contact office' in London to maintain easier and more regular contact with insurers, reinsurers and reinsurance brokers. The first contact office was set up in 1967 by Iraq Re.
4. It must be organised to provide a rapid service. Several companies are building up impressive reputations for settling

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(1) The Mediterranean Re is not included because its headquarters were in London from the outset.

cash loss requirement and other business responses.

5. It must be able to offer technical advice to ceding companies at home and abroad. It is on this point that the limited experience and technical expertise possessed by the Arab reinsurance companies places them at a severe competitive disadvantage compared with the major international reinsurers.

7.4 Conclusions

In so far as both the Arab reinsurance companies and the members of the Arab reinsurance pools retain for their own accounts local business written by the two types of organisation, then both may be deemed to have achieved the objectives of increasing the amount of premiums retained within the region and raising retention capacity. However, the failure of the pools' members to agree on measures to deal with various conditions that have impeded their development have prevented the pools from growing as fast as may have been desired.

Generally the performance of the reinsurance companies in retaining local premiums, obtaining inwards foreign reinsurance business and helping to raise local and regional reinsurance capacity has been far better than that of the pools. How successful they have been in improving their countries', and the region's, net overseas trading balance in insurance and reinsurance business will be examined in the next chapter. One criticism that can be made regarding their method of operation is that the system of compulsory or quasi compulsory reinsurance cessions creates a major obstacle

for the development of direct writing companies, since reinsurance companies take these cessions on terms less advantageous than those available on the international reinsurance markets. The less favourable are those terms, the higher the cost of insurance for policyholders.

CHAPTER EIGHT

INTERNATIONAL INSURANCE AND REINSURANCE TRANSACTIONS AND THEIR EFFECTS ON THE BALANCE OF PAYMENTS IN THE ARAB WORLD

8.1 Introduction

The international balance of payments for any country may be defined thus:

> 'a statement of all claims and obligations which have arisen over a certain period of time between a given country and the rest of the world'. (Lengyel, 1953, p.3).

International insurance and reinsurance transactions have received the attention of very few researchers; these include, S.J. Lengyel, H.O. Nelli, J.J. Launei, G.M. Dickinson, and F.G.Gahin. The seminal - and for many years only - published work on the subject was Lengyel's book 'International Insurance Transactions - Insurance in the Balance of Payments' (1953). It was not until 1977 that Dr. Dickinson in his paper 'International Insurance Transactions and the Balance of Payments' attempted to give more significant meanings and measurements to the various items in insurance transactions.

Most of the developed, and all the developing countries, have a net outflow of funds on their international insurance and reinsur-

ance transactions. (1) In recent years, however, the developing countries have become more concerned about the insurance and reinsurance cost in their balance of payments, though a deficiency of comprehensive, comparable and dependable statistics gravely hinders any assessment of the extent of these costs in most countries, particularly the developing countries. As regards the Arab states, it seems that no real attempt has been made at an official, or non-official, level to assess the effect of insurance and reinsurance transactions on the balance of payments. So, in this study efforts have been made to obtain some data from a variety of Arab countries, but it has only been possible to obtain satisfactory information about the Iraqi insurance industry.

The purpose of this chapter is:

- to analyse the nature of international insurance and reinsurance transactions and their relation to the balance of payments; and
- to measure, as a case study, the place of such services in the Iraqi balance of payments.

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(1) It should be noted that in many of the insurance importing nations, there are highly developed domestic insurance markets. This is certainly true of the United States and Japan. Both of these nations have some restrictions on foreign insurers designed to protect their domestic markets, yet neither of them is able to balance its international insurance transactions accounts. (Launie, 1973, p.16).

8.2 National and Foreign Insurers' Direct Activities in the Arab Insurance Market

Before the establishment of the local insurance companies, foreign insurers had dominated the Arab markets, but at that time, their business was mainly with the foreign merchants in the region. As shown in Chapter three, even after the creation of the local markets, for many years the aggregate premium incomes of foreign insurers were higher than those of domestic insurers. With the steady improvement and stabilization of the local insurance companies, the premium volume of foreign insurers gradually declined in some Arab countries and disappeared in others. However, in Saudi Arabia foreign insurers control the entire market. Their tendency to maintain, and often increase, their share of non-life business is of particular importance to a country like Saudi Arabia. Clearly, this process might have serious effects on the balance of international insurance indebtedness.

Although most Arab governments have sought to curtail the activities of foreign insurers and reinsurers, generally the statistical evidence is insufficient to show exactly what has been the net impact on the balance of payments, not least because of the complexity of measuring such effects.

Insurance operations in the Arab countries are carried on in three ways:

Category 1. Arab national companies whose shareholders are exclusively nationals of the country concerned, whether private or government.

Category 2. Arab national companies with a minority foreign shareholding.

Category 3. Foreign companies operating in an Arab country

in the form of agencies, branch offices, or locally incorporated subsidiaries possibly with a minority local shareholding.

In the context of the above three categories, one finds, briefly, that insurance transactions might affect the country's balance of payments as shown in Table 8.1. Moreover, besides current account transactions there may also be capital movements with categories 2 and 3 as will be shown in Section 8.3 and Appendices 1 and 2.

Table 8.1

Type of Insurer and its Balance of Payments Effects

Type of Insurer	Balance of Payments Effects
Category 1	(i) Net reinsurance payments and obligations abroad from reinsurances ceded and accepted. (ii) Net insurance costs (premiums less claims) for merchandise insurances for goods imported on c.i.f. basis
Category 2	(i) and (ii) as above. (iii) Dividends remitted or owed to foreign shareholders.
Category 3 (a) Agencies and branches.	(iv) Amounts remitted or owed to parent companies being the difference between (a) gross premiums less reinsurances ceded locally, and (b) gross claims paid plus commissions and expenses incurred locally less reinsurance claims recoveries, plus technical reserves retained locally.
(b) Subsidiaries	As in (i) and (iii) above.

8.3 Balance of Payments Classification

The following brief discussion will attempt to disclose how insurance services relate to the current and capital accounts found in the Appendix at the end of this Chapter.

8.3.1. Current Account Transactions

The main categories of current account items are merchandise insurance and non-merchandise insurance. Merchandise insurance includes the supplying of cover, net of reinsurance, on the international shipment of goods, while non-merchandise insurance comprises all other kinds of insurance, including reinsurance operations. However, the transactions of life insurance across national frontiers represents a capital flow as well as a payment for a service. These transactions are considered as a part of 'non-merchandise' insurance in most countries. (Dickinson, 1977, p.6).

Also included in the current account are (Gahin, 1979, pp.16-18):

(i) The service of agents, brokers and loss adjusters. In fact, the international brokers' services constitute an important item of insurance in the current account.

(ii) The mutual exchange of managerial services between branches and subsidiaries and their parent insurers.

(iii) Dividends,interests and other earnings on 'foreign portfolio investment' and 'foreign direct investment' in overseas subsidiaries less taxes payable.

An indication of the relative importance of the various items is provided by the UK's overseas insurance earnings shown in Table 8.4, which conversely represent balance of payment costs for importers of insurance services.

8.3.2 Capital Account Transactions

Since the invisible trade of the insurance sector is recorded in the current account on a 'receivable' and 'payable' basis, the corresponding net financial flows connected with these transactions appear in the monetary sector of the capital account. When payments for insurance and reinsurance coverage do occur between residents and non-residents, this changes the net foreign assets and liabilities of a given country (Gahin, 1979, p.18). Thus, the capital account of the balance of payments reflects all capital flows corresponding to changes in foreign assets and liabilities of a certain country and includes non-monetary and monetary sectors. The non-monetary sector covers long-term and short-term capital flows from investment and the lending of the private sector and that of government not directly related to monetary management; the monetary sector relates to official financing and changes in gold and currency holdings, and other financing (Dickinson, 1977, p.26).

As Dickinson asserts, financial flows from insurance and reinsurance arise in various ways and are recorded in different parts of the capital account. For instance, payments for imports of insurance and reinsurance coverages could be in foreign exchange or in increased foreign liabilities. Thus, since a double entry system

of book-keeping is used, an offsetting credit entry occurs in the capital account. Additionally, the values of insurance and reinsurance coverages which are recorded in the balance of payments as 'receivable' or 'payable' differ from the actual premiums received and claims paid, and this difference needs to be adjusted for inclusion in the capital account. Nevertheless, the element of life insurance constituting important saving' is classified directly in the capital account as a private flow, whilst that part of the life insurance transaction deemed to be an insurance service is included as a part of non-merchandise insurance.

Moreover, portfolio and direct investments represent major items in the capital account. These investments arise from a variety of transactions. For example, if an insurer decides to invest overseas a part of his domestic insurance funds (that is, it engages in overseas portfolio investment), that will result in an increase in the foreign assets of that insurer's country of residence.

According to Dickinson, investment decisions to establish or expand overseas branches or subsidiaries constitute fundamental capital flows, and represent increases in foreign direct investment. The nature of financing such investment arises from a variety of transactions. If such investment is financed through foreign exchange markets, this will result in a decrease in net foreign currency holdings. If payment is made by overseas loans arranged by the parent company then the corresponding flow will be an inward portfolio investment. Sometimes expansion of overseas subsidiaries is financed by loans procured locally by the subsidiaries; in such cases neither the investment nor the financing enters the capit-

al account.

8.4 Impact of International Insurance and Reinsurance Transactions upon Balance of Payments

International insurance transactions are carried out in the following ways:

(1) direct business between the residents of one country and insurers of another;

(2) insurance purchases from branches, agencies and subsidiaries of foreign companies;

(3) insurance attached to international trade;

(4) international reinsurance transactions.

In addition to these activities others may be added, such as that of insurance and reinsurance brokers, loss adjusters, and similar businesses, whose services result from these international activities.

8.4.1 Direct Insurance Transactions

Legislation in most Arab states prohibits residents from purchasing insurance coverage directly from foreign insurers not established in the country. In fact some operations of this nature do take place in a few Arab countries, but it is unlikely that they are on a large scale. When such operations do occur they result in the export of the total amount of premium from the resident's country to the insurer's country. Losses and commissions paid to

local agents on these transactions will result in a return of part of the exported funds to the resident's country. The balance of payments accounts of the purchaser's country will depend on the outflow and inflow of the funds. If the losses and commissions exceed the original premiums outflow the country importing the insurance would show a gain in its balance of payments, and vice versa. But this would not continue in the long-run, as it is essentially a short-term fluctuation.

8.4.2 Insurance Operations through Branches, Agencies and Subsidiaries.

Generally speaking, overseas branches and agencies are considered as if they were run by residents of the country in which they are located, and insurance services purchased by the local policyholders do not enter into the balance of payments. But transactions between these overseas institutions and their parent companies, and with insureds not within the country in which they are located, are considered to be international (Dickinson, 1977, p.26). However, the outflow of funds is larger with this type of transaction conducted by branches and agencies than it is with subsidiaries, but much less than it is in direct transactions (Nelli, 1964, p.3).

The size of international insurance transactions through branches and agencies in the world insurance markets is still relatively large. However, in many countries foreign insurers have been required to convert branches into locally incorporated companies and the trend is for their share in direct business to decrease. Generally that

has been the position in the Arab world where many countries have totally excluded foreign direct insurers (see Chapter three). It is only in Saudi Arabia that the entire insurance business remains in the hands of foreign insurers.

The incorporation by foreign insurance companies of subsidiary companies in the Arab countries marked a more significant stage in the establishment of foreign controlled insurance operations. In those Arab countries that allow foreign subsidiaries to operate, mainly the companies are controlled by those states which already operate on broad international lines, i.e. W. Germany, Great Britain, Switzerland, France and America, as measured by both numbers of companies and size of business. Subsidiaries which are not wholly owned by foreign interests pose a real problem when analysing balance of payments effects. The participation of Arab local capital obviously affects the distribution of profits.

In general, the insurance operations of foreign subsidiaries have the least impact on the balance of payments. This is because all losses paid, plus most of the administrative costs and other expenses, remain in the country of origin and, in effect, only the profits are exported [1] (Nelli, 1964, p.3).

8.4.3 Insurance Attached to International Trade

Due to the importance and magnitude of insurance transactions attached to foreign trade this kind of insurance has received consid-

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(1) In practice, reinsurance ceded abroad by subsidiaries is mostly to their parent companies.

erable attention from all the countries involved, especially the developing states. Even so it is still difficult to find relevant statistics. In order to assess the international insurance of merchandise and its effect on the balance of payments in the Arab countries, two points need to be discussed:

8.4.3.1 Problems Arising from the Evaluation of Insurance Transactions of Merchandise.

Merchandise insurance is recorded by many countries as a separate item in the balance of payments. It consists of

(i) insurances on goods in transit to and from the country in question, and

(ii) insurances on goods in transit between third countries.

From a valuation point of view the insurance on goods between third countries is similar to other forms of non-life insurance registered as non-merchandise (Dickinson, 1977, p.25). The valuation of insurance on imports and exports of the country in question is a task which poses a significant problem. The crucial point is that when goods are exported on c.i.f. conditions of sale the goods are usually insured by the exporter with his local insurers, and this adds the cost of insurance to the cost of the goods. This results in the premium for the insurance being paid by the importer, and constitutes an export of funds from the importer's country, but no international insurance operation seems to occur.

Nevertheless, in most Arab countries this problem is less frequent because it is now compulsory for insurance on goods imported

into the countries to be placed with domestic insurers. Thus, the international insurance transactions of merchandise have only a minor effect on the balance of payments of these countries, (excluding reinsurance on the international shipments of goods). Although the import of goods on a c.i.f. basis is prohibited in most Arab states, the I.M.F. balance of payments yearbook, vol. 31, 1980, nevertheless, shows that some goods were imported in this way into some states, such as Egypt, Sudan, Tunisia, and Northern Yemen. The reason for this is that these imports have been financed by foreign loans and grants, and no doubt they have mostly been insured by the foreign exporters with insurers of their own countries. In this case, however, the insurance transactions are submerged in the international merchandise trade.

In the case of Saudi Arabia no estimates are available of the exact proportions of imports purchased on c.i.f. conditions and no reliable basis can be found for attempts to estimate the actual insurance costs involved. However if all imports were insured outside Saudi Arabia, and the average insurance cost was 1 per cent of the c.i.f. value of imports, the cost of insurance in total imports in 1980 would have been US.$ 314 million, minus any corresponding claims payments.(1) This would have given Saudi Arabia a tremendous deficit on marine cargo insurance costs, but from the figure of US$314 million it is necessary to deduct claims payments to arrive at the net cost. If that cost is unacceptably high then the only solution is for Saudi Arabia also to require the local insurance of imports. The following

(1) Total values of import goods in Saudi Arabia in 1980 was US$ 31.355 billion. I.M.F. Yearbook, 1980.

section outlines some of the arguments in support of, and some of those against, the domestic supply of marine cargo insurance cover.

8.4.3.2 Merchandise Insurance Within the Local Market

All the Arab countries in the past insured their imports and exports with the insurance institutions located in developed countries, but following encouragement by the UNCTAD, most of the Arab countries have begun to conduct insurance of their imports within their own countries.

The placing of merchandise insurance within the local market may be directed in two ways (Chamber of Commerce of the United States, 1972, p.31):

1. By requiring imports to be insured in the country of importation (and in some cases exports in the country of exportation).
2. By imposing high taxes on merchandise insurance placed with foreign companies, or by restrictive import licensing and exchange control regulations.

The following Arab countries do not permit residents to insure imports of goods abroad:(1)

Algeria	Libya	Sudan
Egypt	Mauritania	Syria
Iraq	Morocco	Tunisia
Jordan	Somalia	S. Yemen

(1) Many non-Arab countries also require imports of goods to be insured in the local market. Among these countries are: Argentina, Austria, Brazil, Chile, Colombia, Dominican Rep., Ecuador, Laos, Iran, Pakistan, Venezuela and Zambia.

Two arguments may be advanced in support of marine insurances being insured locally:

1. By insuring its imports with domestic insurers, a country will reduce its outflow of foreign exchange and cut the cost to its balance of payments of goods that otherwise may have been imported on c.i.f. conditions.

2. Protectionof the insurance market will encourage the development of marine business.

Consequent upon such regulations in many Arab states, the number of marine risks which are now insured locally has increased substantially, and the markets are in a better position to develop their marine insurance portfolios. The increase in the number of insured risks should, moreover, reduce the variability of aggregate losses (provided that those risks are independently exposed to loss), so reducing the size of the contingency loading required in premiums and the proportion of the business reinsured. Premium rates have been cut in some Arab states where there is competition between insurance companies, but unfortunately in other states where one direct state insurance company, for instance, is operating in the market, not only do the rates remain high[1] but also there has been no improvement in the insurance services, even though marine business in those countries has achieved good profits in the past years.

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(1) If the rates of marine insurance become unduly high, due to the absence of competition,the result for the national economy will clearly be negative.

In some countries where imports must be insured locally, marine insurance ranks first or second in terms of volume of premium income compared with all other classes of insurance business transacted, (see Table 3.22). Conversely, in countries where local marine insurance for imports is not compulsory, marine premiums tend to comprise a lower proportion of total non-life premium income (see Table 8.2).

Nevertheless, there are a number of arguments against compulsory marine insurance, including:

1. The making of marine insurance for imports compulsory could lead to double insurance.

   Regardless of whether their customers arrange their own insurances, many manufacturing companies in developed countries prefer to purchase marine insurance cover locally from insurers known to them and from whom they may expect to receive speedy claims settlements. Thus two insurances may be effected on the same goods and the purchaser pays for both if the exporter includes the cost of his insurance in the prices charged. However, this problem is declining because Western trading and insurance communities are starting to accept the practice of compulsory insurance for imports. The position becomes confused, however, where both the importer and the exporter are required to effect the marine insurance. According to UNCTAD (1978, pp.67-8), not all imports, for example, are negotiated under normal contracts of sale and aid programmes are an obvious example of this. In this context, India entered

Table 8.2

Comparison of Marine Premium with Other Insurance Branches in Certain Developing Countries where Insurance of Imports with Local Marine Insurers is not Compulsory. (US$000's)

Country	Year	Marine % of total	Fire % of total	Accident % of total
Congo	1975	13.9	21.2	64.9
	1976	10.3	12.8	76.9
	1977	6.6	14.3	79.1
Turkey	1975	22.2	35.6	42.1
	1976	20.2	35.8	44.0
	1977	21.8	34.6	43.6
Malaysia	1973	8.9	21.6	69.5
	1974	9.7	23.3	67.0
	1975	9.0	24.9	66.1
Philippines	1975	24.4	44.0	31.6
	1976	21.4	43.1	35.5
	1977	21.4	43.0	35.6
Thailand	1975	13.4	49.2	37.4
	1976	13.6	48.3	38.1
	1977	13.4	43.1	43.5

Source: Compiled from Table 1 (Aktas, 1979, p.45).

into an agreement with the U.S.A. for a 50 per cent sharing of marine risks. A similar agreement made between the People's Republic of China and Algeria concerning all goods exchange between them.

2. Much of the earned premiums from the operation of marine insurance of imports within a country may still flow to the international market through reinsurance due to the limited retention capacity of local insurers.

It is clear that the development of retention capacity in Arab countries has not grown at the same rate as premiums, but many insurers and reinsurers in the region have now improved their retention capacity over what it was ten years ago. Also they have entered into business exchanges with each other and developed their underwriting capacity, which should enable them to keep more premiums within the local markets.

3. Marine business requires high technical expertise which is either scarce or even non-existent in Arab countries. This is a problem which has been considered in earlier chapters not only in connection with marine business but for other classes of insurance too. If local insurers are inefficient, incompetent, or exploit their monopoly positions it means that industrial and other firms will have to pay more for insurance, thus adversely affecting their competitiveness on world markets.

8.4.4 International Reinsurance Transactions

8.4.4.1 Local Insurance Markets and the International Market

As mentioned in Chapter three, the developing countries, if considered together, represent a vast insurance market, with problems to be sure, but also with a growth potential exceeding that of the rest of the world. Some of the developing countries are themselves of a size sufficient to develop efficient national insurance markets, but considered as one group the size (by area) of the market becomes even more conducive to the creation of large insurance operations.

(Launie, 1973, p.21). However at present all insurance companies must resort to foreign reinsurance to maintain an adequate spread and diversification of the risks insured. No insurance company expects to retain the whole of its insurance acceptances on its own account, and therefore a large portion of the insurance business of developing countries is reinsured internationally, though the need for using the world-wide reinsurance capacity varies from one country to another. Local insurance companies, for instance, with only a small insurance business, limited amounts of capital to devote to insurance, low retention capacity, lack of expertise, etc., have a correspondingly great need for foreign reinsurance. In addition, no one developing country has sufficient resources to cover locally all the risks associated with one jumbo jet or large petrochemical plant. Thus, international reinsurance facilities form an important link in the process of establishing a local insurance industry.

Regarding the balance of payments effects of international reinsurance transactions, the insurance obligations between ceding companies and their foreign reinsurers may result in currency flows in either direction. If the total premiums ceded to the reinsurers exceed the commissions and losses to be paid and the reinsurance deposits to be constituted, then a balance will be due to the reinsurers. In contrast, as the result of poor claims experience the balance will be payable to the ceding companies.

Whatever may be the short-term flows, international reinsurance transactions between direct insurers in a certain country and reinsurers in the international markets undoubtedly have important implications for the balance of payments of both sides. Among the most

important countries in this context are the United States and United Kingdom. The former, a great industrial country with tremendous risk absorption capacity, remains the world's largest net importer of insurance and reinsurance services, whereas Britain remains the greatest insurance and reinsurance exporting country in the world.

A study recently completed by the Bureau of Economic Analysis of the U.S.A. Department of Commerce shows that the U.S. net balance of payments deficit on reinsurance transactions is very small relative to its vast total market premiums. Yet despite the size of its market it still imports reinsurance, though in recent years it has been expanding its own reinsurance acceptance relative to reinsurance ceded abroad (See Table 8.3).

In Britain, the contribution of insurance in the City's foreign earnings increased considerably during the period 1971-1982 as shown in Table 8.4. Over that period the insurance industry contributed £8.658 billion to the net overseas earnings of the U.K's economy (figures include direct insurance). That represented 37.9 per cent of the total overseas earnings of all U.K. financial institutions over the same period.

However, since the absolute size of insurance business in most of the developing countries is quite small, with a greater likelihood of unbalanced portfolios, one major catastrophe may bring an inflow of funds in a year on a scale far greater than several years' premium outflow. A few examples will emphasize this point more clearly. In 1980, the net inflow of reinsurance payments to South Korea amounted to US $46.296 million, as shown in Table 8.5.

Table 8.3

Effect of Reinsurance Transactions on the U.S. Balance of Payments (1957-79)
(Million of dollars)

Year	Reinsurance Imports			Reinsurance Exports			Net Balance of payments effect
	Net premium paid	Claims received	Net payments	Net premium received	Claims paid	Net receipts	
1957	234.2	179.5	54.7	48.0	32.1	15.9	- 38.8
1958	241.8	168.1	73.7	54.5	40.0	14.5	- 59.2
1959	254.5	183.1	71.4	56.2	47.3	8.9	- 62.5
1960	257.1	185.3	81.8	56.8	44.7	12.1	- 69.7
1961	266.4	189.7	76.7	62.0	48.8	13.2	- 63.5
1962	308.1	224.1	84.0	96.9	76.3	20.6	- 63.4
1963	302.4	227.6	74.8	97.0	70.7	26.3	- 48.5
1964	299.5	226.8	72.7	103.5	80.2	23.3	- 49.4
1965	305.8	288.8	17.0	107.0	98.0	9.0	- 8.0
1966	353.9	310.2	43.7	125.3	118.7	6.6	- 37.1
1967	381.9	302.6	79.3	143.2	126.9	16.3	- 63.0
1968	408.1	291.2	116.9	170.7	151.7	19.0	- 97.9
1969	416.7	269.3	147.4	205.7	163.2	42.5	- 104.9
1970	447.7	287.8	159.9	251.4	174.2	77.2	- 82.7
1971	473.6	263.7	209.9	311.1	207.6	103.5	- 106.4
1972	512.9	295.2	217.7	402.0	244.1	157.9	- 59.8
1973	574.6	373.1	201.5	475.9	321.0	154.9	- 46.6
1974	679.1	506.4	172.7	559.6	393.6	166.0	- 6.7
1975	899.5	597.9	301.6	683.3	479.5	203.8	- 97.8
1976	1118.0	619.0	499.0	729.3	536.7	192.6	- 306.4
1977	1271.7	674.7	597.0	783.7	601.2	182.5	- 414.5
1978	1567.0	812.7	754.3	803.3	581.3	222.0	- 532.3
1979p	1672.7	899.0	773.7	837.0	670.7	166.3	- 607.4
Total	13257.2	8375.8	4881.4	7163.4	5308.5	1854.9	-3026.5

p = preliminary.

Source: Derived from statistics on international reinsurance transactions published by the Bureau of Economic Analysis, the U.S. Department of Commerce 1957-1979.

Note: (1) Reinsurance transactions of resident branches or subsidiaries of foreign reinsurers in the U.S. or those of American reinsurers abroad are not included.

Table 8.4

The Contribution of the Insurance Industry to the U.K. Balance of Payments (all figures in £ millions)

	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982
1. The current account of the balance of payments												
Net trade (i.e, exports imports) in:												
visible goods excluding UK oil exports	190	-748	-2,930	-6,061	-4,067	-5,101	-4,263	-3,777	-7,607	-4,900	-6,100	8,523
UK oil exports	-	-	344	710	734	1,172	1,979	2,235	4,158	6,133	9,108	10,642
	190	-748	-2,586	-5,351	-3,333	-3,929	-2,284	-1,542	-3,449	1,233	3,008	2,119
Services and other invisibles	934	971	1,607	2,073	1,820	3,093	2,338	2,700	2,796	2,002	3,539	3,309
Total	1,124	223	-979	-3,278	-1,513	-836	54	1,158	-653	3,235	6,547	5,428
2. Invisibles: contributions of the Government and private(including public corporations) sectors:												
Private - services	940	1,052	1,195	1,594	2,085	3,155	4,037	4,484	4,813	4,900	4,775	4,648
- interest,profits,dividends	716	680	1,456	1,767	1,287	2,013	837	1,255	1,530	420	1,925	2,377
- other transfers	12	-34	-78	-97	-110	28	-	-74	-207	-256	-278	-268
	1,658	1,698	2,573	3,264	3,263	5,196	4,874	5,665	6,136	5,064	6,422	6,757
Government	-724	-727	-966	-1,191	-1,442	-2,103	-2,536	-2,965	-3,340	-3,062	-2,883	3,448
Total	934	971	1,607	2,073	1,820	3,093	2,338	2,700	2,796	2,002	3,539	3,309
3. Breakdown of the contribution of private services												
Financial services												
Insurance	224	240	217	251	323	507	599	640	576	447	617	620
banking,commodity trading,brokerage etc.	227	289	384	534	702	796	792	899	1,012	1,154	1,354	1,525
	471	529	601	785	1,025	1,303	1,391	1,539	1,588	1,601	1,971	2,145
Non-financial services	439	523	594	809	1,060	1,852	2,646	2,945	3,225	3,299	2,804	2,503
Total	940	1,052	1,195	1,594	2,085	3,155	4,037	4,484	4,813	4,900	4,775	4,648
4. The total overseas earnings of the insurance industry (including overseas investment income)												
(a) Underwriting:												
companies-HAT overseas busines written in the UK	40	38	34	32	31	44	46	37	22	9	43	25
- profits from overseas branches and subsidiaries	62	85	76	62	46	190	230	276	256	177	107	77
	102	123	110	94	77	234	276	313	278	186	150	102
Lloyd's-all overseas business written in the UK	141	138	114	127	166	279	334	354	312	188	254	215
	243	261	224	221	243	513	610	667	590	374	404	317
Less earnings of the UK branches,etc. of overseas companies	4	-5	-9	-13	5	-7	-14	-13	-16	-28	-29	-29
	239	256	215	208	238	506	596	654	574	346	375	288
(b) Insurers' overseas portfolio investment income: companies	35	37	47	54	61	73	64	77	95	111	171	264
Lloyd's	16	19	25	37	34	57	48	71	112	153	128	260
	51	56	72	91	95	130	112	148	207	264	299	524
(c) UK brokers' overseas earnings	55	58	60	84	115	170	205	237	228	238	302	362
Total net overseas earnings	345	370	347	383	448	806	913	1,039	1,009	848	976	1,174
5. The City's total net overseas earnings	622	745	831	1,107	1,251	1,823	1,822	2,425	2,019	2,292	3,514	4,369

Notes: * also includes the net earnings of UK insurance companies from reinsurances (other than for marine, aviation and transit) accepted from overseas insurers. Source: UK Balance of Payments, HMSO (Adopted from Carter and Godden, 1983/84, p.196).

Much of this figure resulted from the severe aviation (the Korean Air Lines crash in 1980) and marine losses. The disastrous Managua earthquake of 1972 (property damage: US$1000 million) and the Guatemala earthquake of 1976 (property damage: US$750 million) likewise resulted in the two countries receiving large inflows of reinsurance claims payments.

8.4.4.2 Size of Reinsurance Transactions and its Effect on the Balance of Payments

Owing to the lack of concrete data on comparable reinsurance, it is still not possible to state reliably to what extent the balance of payments of individual developing countries are affected by reinsurance transactions crossing national borders (UNCTAD, 1969, p.96). Also, it is clear that the serious deficiencies in the available statistics prevent any degree of accuracy in the assessment of the size and nature of funds available for remittance and of the net actual flows involved. In fact this is one of the reasons behind the concern felt by these countries about the cost of reinsurance sold to them by foreign insurers and reinsurers.

Even in many developed countries, the shortcomings of national accounts, from the insurance point of view, make it difficult to assess the value of international insurance and reinsurance transactions and the balance of payments. In this respect, Dickinson (1977, p.5) has pointed out that:

> 'Indeed the International Monetary Fund has been making great efforts to increase the quality of balance of payments statistics, and also efforts have been made by the United Nations to help countries to improve the quality of their national income accounts.Nevertheless, individual countries, especially the more developed ones have evolved their own national income and balance of payments accounting systems, and there is some reluctance to change to standards on which there is not full agreement.'

Table 8.5

Effect of Reinsurance Transactions on the Korean Balance of Payments (1980)
(US$000's)

	Reinsurance Imports			Reinsurance Exports			Net balance of payments surplus
	Net premium paid	Claims received	Net payments	Net premium received	Claims paid	Net receipts	
13 Direct companies	36297	68260	-31963	38103	42380	-4277	27686
Korean Re	50148	54026	- 3878	45716	30984	14732	18610
Total	86445	122286	-35841	83819	73364	10455	46296

Source: Falush (1981, p.29).

However, even if one assumes that the information is complete and accurate, it would still be difficult to assess the actual impact of these transactions on the balance of payments due to the following factors:

1. The nature of insurance business; in contrast to many other industries, it operates on a long-term basis.
2. The time lags between underwriting the risks and the payments of premiums and the occurrence of losses are great, particularly in liability insurance. (1)
3. Transportation insurances recorded in the balance of payments provide an unrealistic measure of merchandise insurance. As mentioned earlier, if goods are exported on a c.i.f. basis, and all insurance for them is arranged by the resident exporter with resident insurance companies, no international insurance transactions appear to take place.

As far as the Arab world is concerned, it has been possible to obtain sufficient data to make even a tentative assessment of the effect of international reinsurance transactions on the balance of paymentsonly for Iraq. In the early stages, Iraqi insurers transacted reinsurance business with a few companies only. Now reinsurance is conducted on a wider scale with different countries, especially the United Kingdom, Switzerland and W. Germany.

As to the flow of reinsurance premiums by the Iraqi insurance market, it is evident that the increase in the total written premiums was reflected in the proportionally larger transfers abroad. Table

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(1) The time lags can also be considerable for reinsurance transactions.

8.6 and Figure 8.1 show that the total premiums written in the Iraqi market (domestic written premiums plus premiums accepted from abroad) have increased from ID.11.476 million in 1971 to ID 141.965 million in 1980, with an annual average growth rate of 32.2 per cent while the growth rate of the premiums ceded abroad was 33.5 per cent.

The aggregate written premium during the period 1971-80 were ID.550.000 million, of which ID.222.212 million, that is 40.4 per cent, were ceded abroad. The contribution of the National Insurance Company towards the total premiums ceded abroad was 64.5 per cent of Iraq Re 34.5 percent, and Iraqi Life Insurance Company , 1.0 per cent. The total premiums accepted from abroad by the Iraq Re were slightly higher than the total premiums ceded abroad by the company during the period 1971-80 (see Table 8.6).

Table 8.7 shows the percentage increase during the period 1971-80 of total premiums written in Iraq, the reinsurance exported to foreign countries, and the net premium balance. The total premium volume has grown very rapidly during this period. In 1980 it had risen to 1237 per centabove the 1971 volume. The net premiums ceded abroad have shown a much higher percentage increase than that of the net premiums accepted from abroad, and even higher in many years(e.g. 1974, 1976, 1977, 1978 and 1980) than the percentage increase of the total written premiums in the market. The net difference in absolute amounts is very much in favour of foreign markets.

Clearly the figures in Table 8.6 do not give an accurate indication of the effects of reinsurance transactions on the balance of payments, which requires commissions and losses to be deducted from the premiums paid to, or received from abroad. It is proposed

Table 8.6

Total Written Premiums by the Iraqi Companies and Premiums Ceded Abroad

Million of ID

Year	Direct written premiums		Premiums accepted from abroad		Total written premiums	Reinsurance ceded abroad			Total premiums ceded abroad
	National Ins. Co.	Iraqi Life Ins. Co.	Iraq Re	National Ins. Co.		National Ins. Co.	Iraqi Life Ins.Co.	Iraq Re	
1971	7.502	0.905	3.069	na	11.476	2.813	0.045	1.586	4.444
1972	8.132	0.976	3.583	na	12.691	2.741	0.036	1.778	4.555
1973	10.440	1.125	3.964	na	15.529	3.602	0.038	2.365	6.005
1974	23.060	1.707	4.621	na	29.388	8.993	0.141	3.761	12.895
1975	35.947	2.598	6.893	94	45.532	11.611	0.309	5.954	17.874
1976	43.462	3.176	8.244	0.123	55.005	14.343	0.230	6.690	21.263
1977	48.675	3.298	10.640	0.146	62.759	16.988	0.167	8.088	25.243
1978	53.171	4.832	11.512	0.224	69.739	18.131	0.248	8.654	27.033
1979	87.031	6.583	12.111	0.191	105.916	23.150	0.386	19.515	43.051
1980	120.492	9.152	12.064	0.257	141.965	40.967	0.697	18.185	59.849
Total	437.912	34.352	76.701	1.035	550.000	143.339	2.297	76.576	222.212

Source: Compiled from the Annual Reports of two direct insurers and the Iraq Re.

Note: The National Insurnce Company does not normally underwrite reinsurance business.

Figure 8.1

Relative Changes in Written Premium in Iraq and Reinsurance Ceded Abroad (ID. Million)

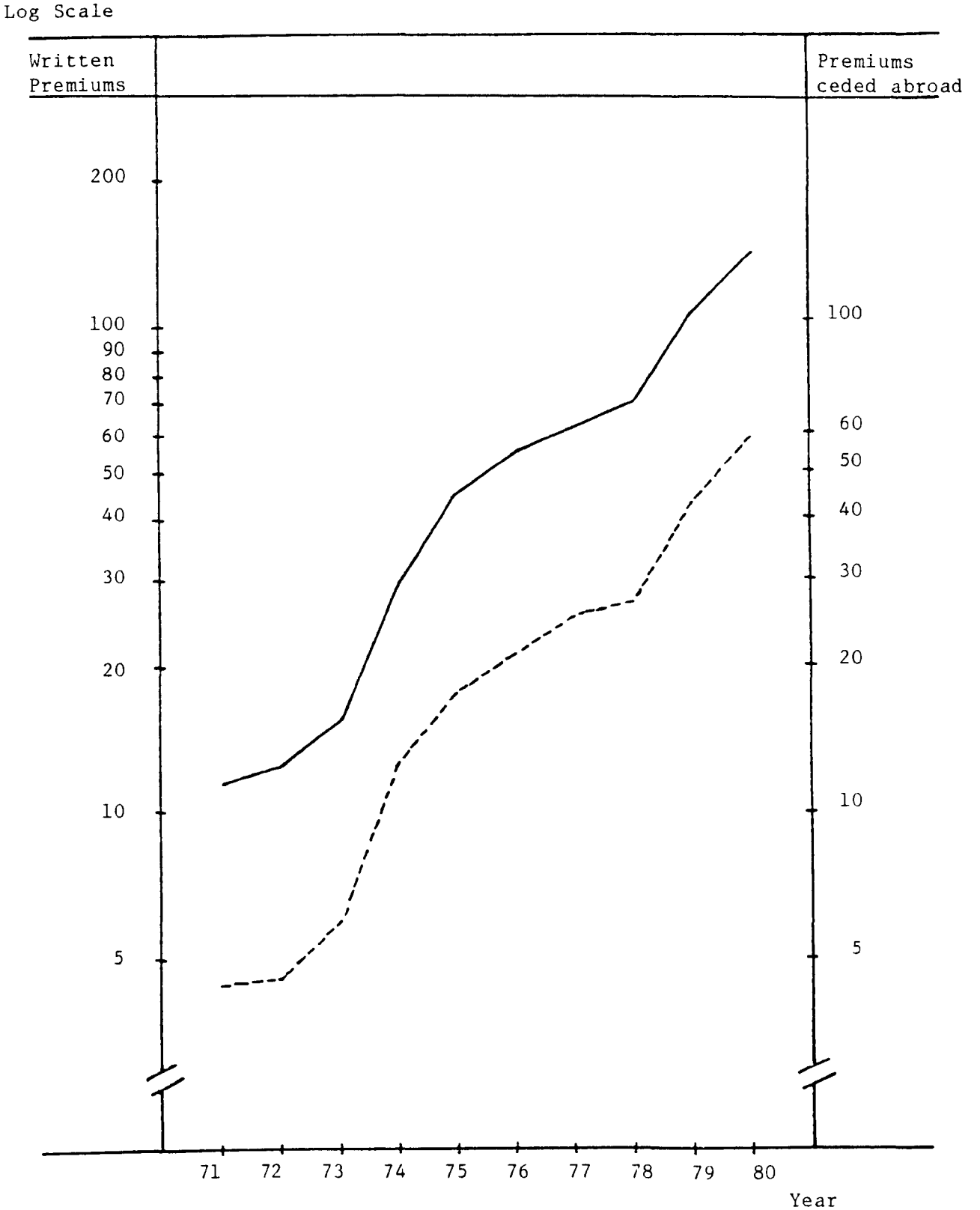

Table 8.7

Index of Written Premiums in the Iraqi Market, Reinsurance Premium Ceded to and Accepted from Abroad and Net Premium Balance (1971-80)

(1971=100)

Year	Total written premiums	Net premiums ceded abroad	Net premiums accepted from abroad	Net premium balance in favour of foreign reinsurers
1971	100	100	100	100
1972	111	102	117	71
1973	135	133	129	148
1974	256	278	150	602
1975	397	383	232	792
1976	479	509	274	938
1977	547	609	354	1051
1978	608	652	385	1123
1979	923	902	404	2236
1980	1237	1459	402	3457

Source: Table 8.6

to measure the balance of payments effect as follows:

Net balance of payments effect[1] = Net funds payments - Net funds receipts

Where

Net Funds Payments = Reinsurance premiums paid abroad
- Reinsurance commissions received from abroad
- Reinsurance losses recovered from abroad.

Net Funds Receipts = Reinsurance premiums received from abroad - reinsurance commissions

(1) We are measuring only amounts falling due for payment, though not necessarily cash flows because of premium and loss deposits. This leaves the problem of outstanding claims which in balance of payments terms are credits from the standpoint of the ceding company's country. So the total balance of payments debit for the whole period shown in Table 8.8 would be less than ID. 68.108 million.

paid abroad - reinsurance losses paid abroad.

Table 8.8 shows the reinsurance imports and exports in the Iraqi insurance market, during the 10 year period 1971-80. The data show that the net premiums paid (premiums less commissions) have increased from ID 2.966 million in 1971 to ID 43.262 million in 1980, an increase of 1459 percent, while the net premiums received increased from ID 2.118 million to ID 8.516 million, a rise of 402 percent.(1) The smaller growth of exports may be attributed to the fact that the Iraq Re represents the Iraq reinsurance market as a sole exporter of reinsurance business. Its foreign portfolio has remained far below its home portfolio due to the company's selective and very restrictive underwriting policy. This table also shows that the result of reinsurance transactions was a net balance of payments deficit of ID 68.108 million, or 12.4 percent of the total written premiums of the market.

One of the questions raised in Chapter 7 was whether the establishment of a national reinsurance company might lead to an improvement in a country's balance of payments. There are two points of evidence which bear on that question:

1. During the period 1971-80(2), the Iraq Re's net payments on

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(1) The success in acquiring inwards foreign reinsurances has reduced the net premium deficit relative to both Iraqi premiums, total written premiums and premiums ceded abroad.

(2) Information was provided by the three Iraqi companies subject to the non-disclosure of their figures in detail. However, the deficit (i.e. ID 58.793 million) made by the National Insurance Co. and the Iraqi Life Insurance Co. is the difference between the Iraq Re's deficit of ID 9.315 million and the total deficits ID 68.108 million.

Table 8.8

Effect of Reinsurance Transactions on the Iraqi Balance of Payments (1971-80) (ID.000's)

Year	Reinsurance Imports(-)			Reinsurance Exports			Net balance of payments effects (3-6)
	Net premium paid 1	Claims received 2	Net payments 3	Net premium received 4	Claims paid 5	Net receipts 6	
1971	2,966	890	2,076	2,118	1,482	636	- 1,440
1972	3,033	1,150	1,883	2,473	1,714	759	- 1,124
1973	3,939	1,719	2,220	2,735	2,025	710	- 1,510
1974	8,233	2,342	5,891	3,175	2,191	984	- 4,907
1975	11,351	4,307	7,044	4,903	2,850	2,053	- 4,991
1976	15,092	5,908	9,184	5,795	3,735	2,060	- 7,124
1977	18,058	9.190	8.868	7,488	5,998	1,490	- 7,378
1978	19,336	8,121	11,215	8,164	6,991	1,173	- 10,042
1979	26,753	10,866	15,887	8.563	7,350	1,213	- 14,674
1980	43,262	28,312	14,950	8,516	8,484	32	- 14,918
	152,023	72,805	79,218	53,930	42,820	11,110	- 68,108

Source: Compiled from the Annual Reports and Accounts of the two direct companies and the Iraq Re.

its reinsurance retrocessions abroad (totalling ID 76.576 million) amounted to ID 19.388 million or 25.3 percent of premium ceded abroad. However, over the same period it was able to reduce the drain on the country's balance of payments by securing net payments on reinsurance exports amounting to ID 10.073 million or 13.1 percent of premium accepted from abroad, thus reducing the net payments deficit to ID 9.315 million.

2. As noted in Chapter 7, the profits on Iraqi business are too high, so that Iraqis are paying too much for insurance. Although the profits on the net retained accounts may have been boosted through the receipt of over-riding reinsurance commissions and profit commissions, it nevertheless seems that the business accepted from abroad has been less profitable than that ceded abroad. However, the Iraq Re did retain over the eight years 1973-80 total domestic premiums amounting to ID 101.696 million: if instead those premiums had been placed abroad by the two direct insurance companies, the net deficit on reinsurance transactions would have increased by ID 41.056 million.

A possible flaw in these arguments is that the Iraq government instead of forming a separate reinsurance company could have increased the capitalisation of the direct insurance companies, thereby enabling them to have increased their retention limits and avoiding double handling costs. Such an argument would be less applicable to a country with a direct market composed of several competing companies, and by forming a specialist reinsurance company it might be able

to develop reinsurance expertise more rapidly than otherwise.(1)

Regardless of what might be the net effect of the Iraq Re, the total balance of payments deficit made by the three Iraqi companies is still so large that it is significant in relation to the total written premiums in the market. The factors leading to this situation are several, but amongst the most important may be listed the following:

1. The lack of sufficient capacity and experience in the Iraqi insurance industry can be considered as the main reasons for the large volume and cost of reinsurance imported by the country, particularly in earlier years. During the last decade, the position has considerably improved.
2. The high profits on Iraqi business have increased the net balance of payments deficit.
3. The number of large risks has increased rapidly, and a situation has been created whereby a very high proportion of these risks inevitably are reinsured abroad.
4. The complicated reinsurance programme arrangements and lack of expertise are creating some obstacles in determining adequate retention limits, which might increase the amount of premium retained. This subject will be discussed in the following four chapters.

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(1) Since the I.D. 145.636 million reinsurance premiums ceded abroad by the National Insurance Co. and the Iraqi Life Insurance Co. have produced a net payment of ID 58.793 million, it axiomatically follows that if the ID 101.696 million had been ceded abroad, it would have resulted in a net payment of ID 41.056 million.

If the economy continued growing at the same rate as in the past and no changes were made to existing reinsurance arrangements, then the balance of payments deficit would continue to deteriorate. However, circumstances cannot be expected to continue unchanged. The main factors which will affect the reinsurance transactions in Iraq are:

1. The growing retention capacity and experience of the Iraqi insurance market should reduce the size of the need for foreign reinsurance. For example, since 1982 the National Insurance Company has changed its marine cargo quota share and surplus treaty to a surplus treaty only. The same has occurred in the case of the fire quota share and surplus treaty. Retention capacity rose substantially in 1982 over the 1981 figures as shown below:

Reinsurance treaty	Retention Limits (1) 1981	1982
Fire and allied perils	ID 375,000	ID.1,200,000
Marine cargo	ID 375,000	ID.1,500.000

2. The economic development plan is considerably affected by the Iran-Iraq War and it might be scaled down in the near future. This may cause a reduction in the size of international trade and the number of new projects, and may result in lower insurance and reinsurance activities.

3. So far the trend of insurance losses in the Iraqi market has been satisfactory (as shown in Chapter three), but it is difficult to predict what may occur in the future particularly as the number of large risks has been growing very rapidly

(1) Excess of loss covers are arranged for both treaties in order to reduce the company's retention limits.

during the last decade.

8.4.4.3 Balance of Payments Effects on the Basis of Cash System

The balance of payments, as defined in Section 8.3 above, is a statistical statement for a given period showing the exchange of funds and transfer from, and to, the country in question. It is a form of double entry accounting which can be described as follows:

> "The basic convention applied in constructing a balance of payments statement is that every transaction that is recorded is to be represented by two entries that have exactly equal values. One entry of each of these pairs is designated as a credit and conceived as having a positive arithmetic sign, while the other entry is called a debit and given a negative sign. Thus, in principle, the sum of all the positive entries is identical to the sum of all the negative entries, and the net balance of all the entries in the statement is zero." (I.M.F. 1977,p.8).

The measurement of the balance of payments on the cash system is deficient in a number of ways. In particular it ignores the time lags which may occur in concluding international transactions (Youssef, 1971, p.323): Such lags are of considerable importance in relation to insurance transactions, where earnings and remittances in insurance rarely go together for a number of reasons. Lengyel (1953, p.3) explains the phenomena thus:

> "(i) earnings from the business may be reinvested in the country of origin,
> (ii) losses may be covered by funds at the disposal of the foreign insurer in the country in question, while no transfer takes place. On the other hand
> (iii) a change in investment policy will result in remittances, and
> (iv) exchange control regulations and/or statutory requirements will also play an important part in remittances."

One could add that considerable delays often occur between the inception of an insurance/reinsurance contract and the settlement

of claims occurring on that contract. Consequently the actual transfers of funds are not an appropriate measure of the balance of payment effects in international insurance transactions.

Table 8.9 and Figure 8.2 show the reinsurance transactions in Iraq on the cash basis system, and its effect on the balance of payments. The balance of payments deficit is calculated on the basis of remittances. Actual remittances give a very different picture from the real indebtedness, shown in Table 8.8 arising from international reinsurance transactions, and they are obviously very much below the real indebtedness. The National Insurance Company's share of the total foreign exchange paid abroad during the period 1971-80 was 58 per cent; that of Iraq Re 41.5 per cent and the Iraqi Life Insurance Copany just 0.5 per cent. On the other hand, the share of each company of the total foreign exchange received from abroad was 20.4 per cent, 79.6 per cent and zero per cent respectively.

The aggregate balance was a deficit of ID 29.065 million for the same period. The National Insurance Company's share of the deficit was quite significant, amounting to ID 26.578 million, 91.4 per cent of the total deficit during 1971-80. The Iraq Re's share of deficit was ID 2.264 million representing 7.8 per cent of the total deficit.

Furthermore, although the Iraqi Life Insurance Company's share of the balance of payments deficit was very small (i.e. ID 224 thousand, which accounted for only 0.8 per cent of the total deficit), we believe that, from the practical point of view, the company does not need to purchase reinsurance from abroad except for very large

cases and sub-standard lives, e.g. diabetics heart conditions etc., in which the foreign reinsurers may specialise. There are two reasons for this belief. Firstly, the sums insured in most life policies are still small, except group policies. Secondly, after the company's retention (which ranged between 80 percent and 93 percent during the period 1971-80) the Iraq Re can absorb all the surpluses of the company without resorting to foreign markets. Therefore the question may be asked as to why the company cedes its surpluses to the international reinsurance markets. Possibly the company may have wanted to continue its relationship with its overseas reinsurers in order to obtain their assistance in technical matters such as the underwriting of sub-standard lives.

Finally, mention should be made of the foreign exchange control in the Iraqi insurance market. The three Iraqi companies are not hindered by foreign exchange control in correctly transferring abroad their reinsurance debit balances on a quarterly or half yearly basis.

Table 8.9

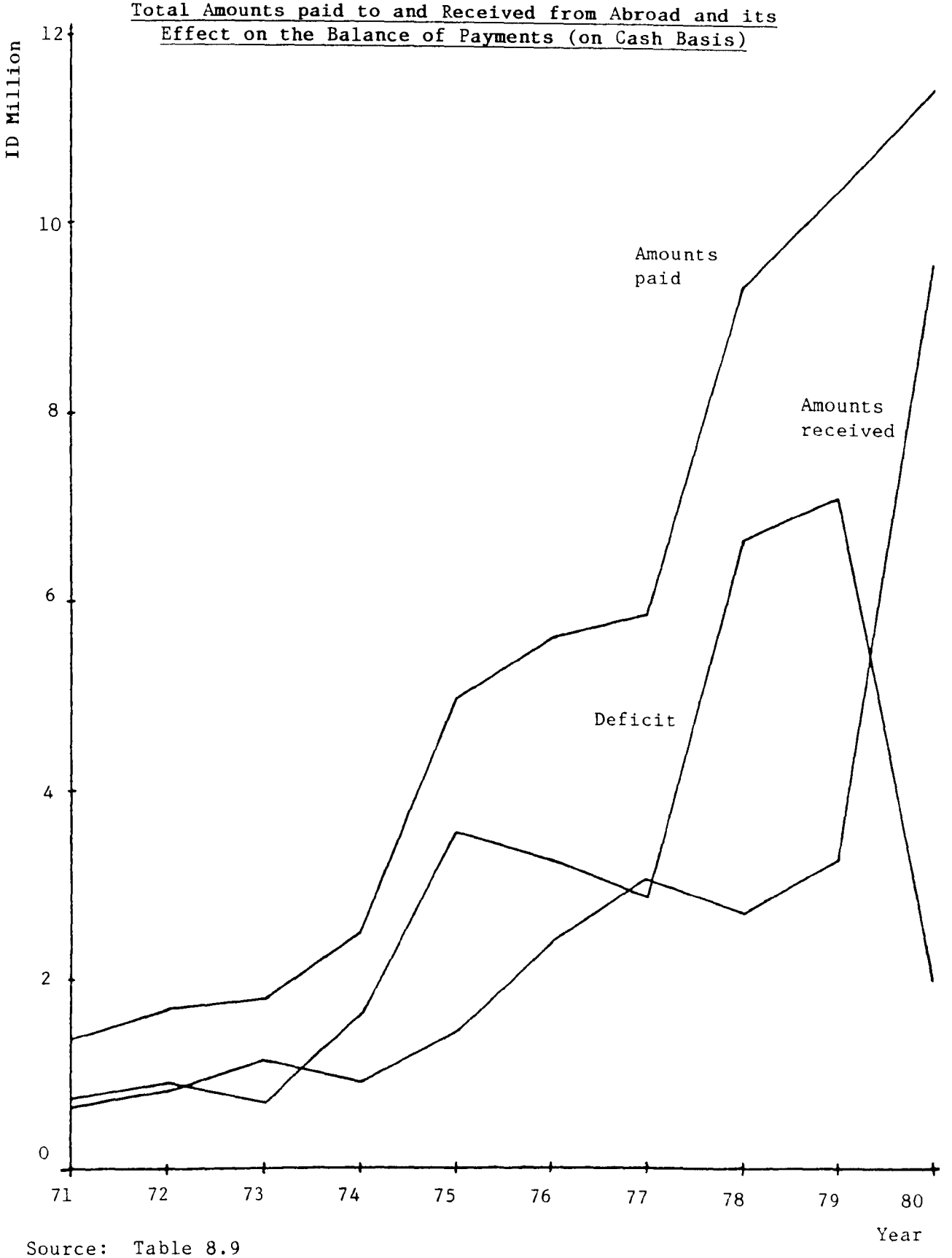
Total Amounts Paid to and Received from Abroad and their Effect on the Iraqi Balance of Payments on Cash Basis for 1971-80. (in Thousand I.D.)

Year	Total Actual Amounts Paid	Total Actual Amounts Received	Deficit
1971	1,377	636	741
1972	1,698	803	895
1973	1,794	1,127	665
1974	2,501	881	1,620
1975	4,952	1,427	3,525
1976	5,605	2,369	3,236
1977	5,853	3,021	2,832
1978	9,301	2,678	6,623
1979	10,338	3,264	7,074
1980	11,407	9,555	1,852
Total	54,826	25,761	29,065

Source: Extracted from the financial departments accounts of the two direct insurance companies and the Iraq Re.

Figure 8.2

Total Amounts paid to and Received from Abroad and its Effect on the Balance of Payments (on Cash Basis)



Source: Table 8.9

8.5 Some Policy Considerations

Business ceded from the Arab countries to foreign insurers and reinsurers is increasing considerably from one year to the next, and this business, in general, has been profitable. However, a very common argument asserts that the Arab countries purchase too much reinsurance, and therefore there is an unnecessary outflow of foreign exchange, which in turn has an undesirable effect on the countries' balance of payments. Indeed, the Arab countries are still heavily reliant on foreign reinsurance, but whatever the size of the reinsurance purchased, it seems quite natural that the main problem is inherent in the insurance markets of these countries. Given their lack of capital, managerial expertise, reserves and retention capacity, the Arab countries cannot easily avoid buying too much foreign reinsurance.

Nevertheless, some steps can be taken which, to some extent, could reduce the deficits in the Arab countries' balance of payments[1].

First there are those measures that have already been examined in earlier chapters, which can be summarised as follows:

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(1) Undoubtedly the importance a government will place on improving its balance of payments position will depend on its overall balance of payments situation. There will be less need for a government like Kuwait or Saudi Arabia with a large current account credit balance to reduce any insurance deficit than for a government like Egypt with an overall deficit. Despite this fact, in principle whether a country is rich or poor, in order to reduce foreign exchange outflow, it should find ways and means for improving its balance of payments position as far as the insurance and reinsurance transactions are concerned.

- Improving the experience and skills of the companies' personnel.
- Building up and strengthening the companies' financial bases.
- Encouraging co-insurance where several companies operate in a market.
- Advising policyholders on loss prevention matters.
- Improving the standard of insurance legislation and supervision.
- Establishing national/regional reinsurance companies and pools.
- Increasing co-operation between Arab insurance markets above all in the case of large risks and natural hazard risks.

Secondly it may be possible to raise companies' standards of reinsurance planning, including the forms of reinsurance employed and the fixing of retention limits in relation to the nature of risk and type of reinsurance selected, and thereby reduce the amount of business ceded abroad. The fixing of retention limits will be examined in the following four chapters.

8.6 Conclusions

Self-sufficiency in insurance is neither sought by any country,

nor possible. Thus, the purchase of foreign reinsurance by domestic companies is necessary, and, of course if the domestic reinsurance cessions abroad are profitable, then they will result in an outflow of foreign exchange abroad.

Governments of Arab, and indeed all other developing countries, are concerned about the outflow of reinsurances and thus foreign exchange. The absence of reliable statistics prevents any degree of accuracy in the assessment of the actual funds outflow, but the volume of reinsurance transactions leads them to believe that the net foreign exchange outflow is substantial.

As a result of that concern, several changes have occurred in Arab markets, such as legislation on insurance and reinsurance imports restrictions, sometimes the setting up of a national reinsurance company receiving compulsory or voluntary cessions. However, the available statistics about the Iraqi insurance market show that the rapid growth of domestic premium income during the 1970's has been more than equalled by the growth of foreign reinsurance imports. However, the establishment of the Iraq Re appears to have reduced expenditures of foreign exchange considerably thereby improving the country's balance of payments, though international reinsurance transactions still constantly resulted in unfavourable balances to Iraq in all the years 1971-1980. The net balance of payments deficit was equal to 12.4 per cent of the total written premiums in the Iraqi market for that period.

In the long run foreign insurers and reinsurers expect to make a profit and that means that business placed with them will involve a balance of payments cost, but that is the price that has

to be paid by policyholders and ceding companies for protection against short-term fluctuatins in claims experience. Sometimes it can result in a net inflow of foreign exchange at a time a country needs it (e.g. following a natural disaster). Therefore the failure of a country to secure a balance on its trade in insurance with the rest of the world need not per se be disadvantageous to its economy, but it certainly merits examination by the authorities.

Appendix 8.1

Transactions arising from insurance trade in the balance of payments

	Current Account	CREDIT	DEBIT
1.	Trade in goods (merchandise)		
2.	Freight and insurance on international shipments of goods	Export of merchandise insurance (net premiums)	Claim payments on merchandise insurance exports
3.	Investment income		
	(a) On direct investment		
	(b) On portfolio and other investment	Interest on foreign assets (less overseas taxes payable)	
		Interest on balances held with non-resident reinsurers (less overseas taxes payable)	Net interest accruing to non-residents on life policies with resident insurance companies
4.	Government services and transfer payments		
5.	other services	Exports of non-merchandise insurance (net premiums)	Claims payments on non-merchandise insurance
		Services provided by resident brokers and adjusters	Services provided by non-resident agents/ brokers and adjusters
	Capital Account		
	Non-monetary sector		
6.	Private long-term capital flows		
	(a) Direct investment	Increase in equity of non-residents in resident life insurance company funds	Net increase in foreign private sector investments
	(b) Portfolio and other investment		Net increase in funds held by non-resident reinsurers
7.	Private short term capital flows		
8	Local and Central government		Net increase in foreign government securities
	Monetary sector		
9.	Other official financing		
10.	Changes in gold and currency holdings	decrease*in foreign currency holdings	Increase in foreign currency holdings *decrease arising from exceptionally large claim payments

Source: Dickinson (1977, p.27).

Appendix 8.2

Transactions arising from overseas establishments in the balance of payments

Current Account	CREDIT	DEBIT
1. Trade in goods (merchandise)		
2. Freight and insurance on international shipments of goods		
3. Investment income		
(a) On direct investment	Earnings of overseas branches and subsidiaries (less overseas taxes payable)	
(b) On portfolio and other investment		
4. Government services and transfer payments		
5. Other services	Management services provided by parent company for overseas branches and subsidiaries	Management services provided by overseas branches and subsidiaries for parent company
Capital Account		
Non-monetary sector		
6. Private long-term capital flows		
(a) Direct investment	Transfer of shares to foreign acquiring company	Receipt of shares in foreign acquired company
(b) Portfolio and other investment	Transfer of financial assets to overseas branches and subsidiaries Foreign loans raised by parent company for overseas branches and subsidiaries	Increase in equity in overseas branches and subsidiaries
7. Private short term capital flows		
8 Local and Central government		
Monetary sector		
9. Other official financing		
10. Changes in gold and currency holdings	Decrease in foreign currency holdings	Increase in foreign currency holdings

Soruce: Dickinson (1977, p.29).

CHAPTER NINE

FACTORS RELEVANT TO THE DETERMINATION OF RETENTION LIMITS

9.1 Introduction

One of the themes running through previous chapters has been that for most classes of insurance business insurers in the Arab insurance markets still retain only a small proportion of the risks which they underwrite, thereby limiting their own growth in terms of retained premium income and imposing costs on their countries' balance of payments. Chapter 7 was concerned with examining the efforts that have been made to increase the proportion of business retained within the Arab region. Now in this and the following three chapters attention will be focused on an examination of how insurance companies should seek to achieve optimum retention levels and the actual record of two Arab companies in relation thereto.

In one sense, an insurance company's retention may be defined as the maximum sum it may be called upon to pay in respect of any one claim, or a series of claims, net of any recoveries it may obtain from its reinsurers. So, for example, Reinarz (1969, p.103) refers to a retention as:

> "The uninsured liability or loss according to the kind of reinsurance contract concerned".

So defined, an insurer's retention would include such sums as it may unexpectedly be called upon to pay itself because of any deficiencies in its reinsurance arrangements. More usefully from the

standpoint of the efficient management of an insurance company, a retention may be thought of as the maximum sum which it would wish to bear itself, as in the following two definitions:

> "The maximum amount that the company is prepared to pay on any loss affecting a policy, risk or group of risks". (Swiss Re, 1980, p.47).

> "The amount of liability which a ceding company retains for its own net account on a particular risk or in the event of a catastrophic event affecting several risks at the same time". (Rangarajan, 1979, p.50).

Both of these definitions also emphasise that an insurance company in fixing its retention limits needs to pay regard to both potential claims in respect of individual risks and accumulations of claims arising from the occurrence of one event. One could add that it should consider too the potential accumulations of all claims arising during any one planning period. The fixing of such retentions is of paramount importance to the performance and solvency of an insurance company. Therefore, the purpose of this chapter is:

- to examine the factors that should be considered in fixing retention limits and their relationship thereto;
- to provide a framework for the analysis of retention limits and guidelines which will be undertaken in the following three chapters.

9.2 Objectives in Fixing Retention

The main objective of an insurance company in fixing its retention limits is to control fluctuations in either (i) its annual

loss ratio; or (ii) its annual business results; or (iii) its cash flow (Buhlmann, 1964, p.42). Any insurance company is faced with two apparently mutually exclusive options: (a) to underwrite as much as possible for its own account, or (b) attempt to stabilize the inherent fluctuations within each class of business. In fact there is an inverse relationship between the two options which is so close that any attempt at maximising one will result in minimising the other. Therefore, and under given circumstances, the company's management will determine which of the two objectives is more important, and make a compromise between them.

In order to reduce loss ratio fluctuations and stabilize business results, the insurance company must fix its retention at a level sufficient that the premium retained for its own account, together with the funds available, will at least be sufficient to cover the loss payments for which it might become liable (Gerathewohl, 1980, p.129). This is a major problem for all direct insurers worldwide, and it is particularly acute in the developing countries. The real problem of insurers in the latter countries is to fix their retentions at levels commensurate with their desired financial security without unnecessarily ceding abroad too much reinsurance.

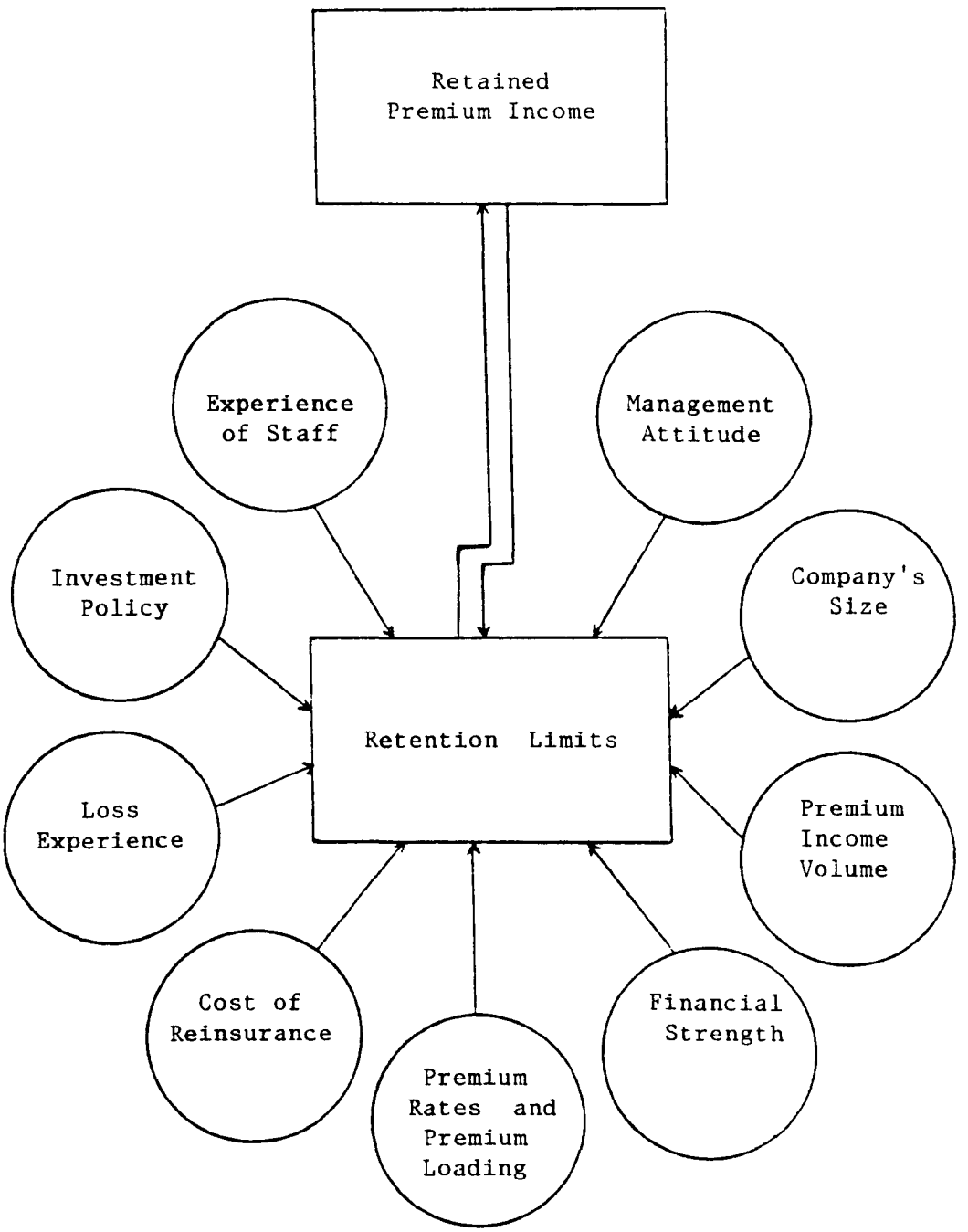
Some of the factors which ought to influence an insurer in making such decisions are examined below (see figure 9.1).

9.3 Factors to be Considered When Fixing Retentions

There are a number of key factors which, if taken into account, will help a company to fix its retention limits correctly.

Figure 9.1

Factors to Consider When Fixing the Level of Retention



9.3.1 The Attitude of Management

Management attitudes to risk play a large part in determining a company's chosen retention limits.(1) They decide the nature and the range of liability exposures which are acceptable, which in turn, affects the size of premium retained and consequently the volume of reinsurance ceded.

Gerathewohl (1980, p.129) in stressing that management attitudes have an important bearing on decisions regarding retention limits has said:

> "Fixing the retention is always a genuine management decision, where a selection must be made from several possibilities, and management priorities must be determined. These priorities may differ completely from one company to another. The correct retention does not therefore, exist, and one must realize that each retention has to be seen within the specific situation involved".

Hence the size of a company's chosen retention limits depends mainly on the philosophy of management and its knowledge.

9.3.2 The Size of the Company

Company size plays an essential role in determining the size of any loss it can absorb on any one risk or any one event. More

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(1) "A discussion has been held with several managers and underwriters in London on this most important question and the answers which have been given were invariably the same. They fix their retentions first of all as a management decision and then vary them up or down according to the availability and price of excess of loss protection". (Kingsbury, 1980, p.11).

specifically, there is a direct relationship between the size of a company and its retention limits. Whether the size of a company is measured in terms of its premium volume or its capital and free reserves, most difficult in the Arab states, and in other developing countries are relatively small, so that they are forced to operate with relatively low retention limits.

9.3.3 Premium Income Volume

The premium income volume of any class of insurance has a direct relationship to the size of the retention limits. Generally, the larger the premium income, the higher may be the retention.

However, the size of premium income alone is not a sufficient guide; equally important is the risk profile of the account, e.g. is it composed of a large number of relatively small independent risks, or a few large risks, or a mixture. Theoretically, depending on the nature of an insurance portfolio, one loss may range in size from less than 1 per cent to more than 100 per cent of a company's premium income; such large variations in the size of insured losses make it extremely difficult to plan a company's operations. Thus, an insurance company should decide when fixing its retention that even if a major loss should occur, its retained loss should not exceed a specified proportion of the premium retained for its own account (Rangarajan, 1979, p.51). Consequently, as a guide for fixing retention limits, the Swiss Reinsurance Company (1965, p.5 and 1978, p.49) suggests the use of the following formula which would stabilise the underwriting result, though it does not take

into account the company's capital and free assets:

$$M = X\% \times p$$

where M = Maximum limit of retention per risk or per event.

p = Retained Premium income.

Swiss Re then recommend that the percentage X should be within the following limits:

Per risk = generally around 1% for a large company and up to 10% for smaller companies

Per event = generally between 1% and 3% for fire and accident business and as high as 5% for marine business.

Following this approach the impact on a company's claims ratio of any one loss or an accumulation of losses from one event will be limited to a predetermined percentage. Although in order to control their reinsurance costs smaller companies generally are forced to fix high retention limits per risk in relation to their retained premiums, the limits in actual currency amounts are not large.

9.3.4 The Financial Strength of the Company

The financial position of an insurance company is of key importance to the fixing of any retention limits. Carter (1979, p.325) for example says:

> "... there is a direct relationship between the size of a company's reserves relative to the volume of business written and the amount it can retain for its own account".

Likewise Gerathewohl (1980, p. 133) argues that:

> "... the more funds the direct insurer is willing and able to utilize, should the premium be inadequate, the higher the retention may be".

Conversely it follows that the smaller is a company's retention limit , the smaller will be its reserve requirements (Marcuard, 1966, p.53). It would be unwise, however, to pay regard only to the size of a company's reserves in fixing its retention limits, consideration also must be given to the potential variation in its claims experience which will be influenced by the size distribution of its insured risks. Marcuard illustrates this point by the following example produced by Sergowsky.

> A portfolio of 300,000 fire risks, the largest being 5,000,000 and the smallest 1,000 (the composition of the portfolio being arbitrarily chosen, with relatively few large and small amounts) shows the following reserve to be necessary (mathematically expected deviation):

	Required reserves
No reinsurance	144% of the risk premium
With retention limited to 500,000	55% of the risk premium
With retention limited to 200,000	35% of the risk premium
With retention limited to 100,000	21% of the risk premium

The calculation is based on the principle that the maximum retention depends firstly on the amount of the available reserve fund and secondly on the absolute deviation of the fire losses. If this assumption is made for the maximum retention, the necessary reserve can be expressed quantitatively by the following formula:

$$\sum_{i=1}^{n} C_i R_i = \text{Necessary Reserve}$$

where n = number of groups of similar risks which together make up the portfolio.

C = most probable annual loss cost (risk premium).

R = relative deviation in the loss ratio.

The simplest approach to fixing retention limits to an insurers' financial strength is again the use of rules-of-thumb, such as the following given by the Swiss Reinsurance Company (1965, p.6 and 1978, p.49):

$$M = Y\% \times (C + S)$$

where C + S = capital plus free reserves (policyholders' funds) and with the recommended values for Y% being:

Per risk: generally not more than 1% for a large company and up to 5% for smaller companies

Per event: generally between 0.5% to 1.5%, representing the number of maximum claims which if not payable from premium income, would consume all the capital and free reseves.

This approach ensures that no loss event may reduce capital and free reserves by more than Y%.

Another formula suggested by Swiss Re relates the retention limit per risk to the company's liquid assets as follows:

$$M = Z\% \times A$$

where A = Liquid assets which should be around 5 times the maximum retention per loss in the company's most important branch.

Z% = An estimate of how many times per year large

claims will require immediate payment. If a company's estimate is N (e.g. 10) times, then $Z = \frac{100}{N}$ (e.g. 10%).

This rule aims at ensuring that funds are available for the immediate payment of claims.

The main weakness of such simple rules-of-thumb as those cited by the Swiss Re is that the growth of an insurer's premium income is not necessarily matched by a proportionate growth of its capital and free reserves. For example, premium expansion may be at the expense of profits, and even if profits keep pace with premium income a sufficient amount of profit may not be retained to maintain the company's solvency margin (Gilmore, 1980, p.383). In many private companies in the Arab states shareholders prefer to receive dividends rather than finance premium growth. A large number of companies in the region distribute a very high share of their annual profits. On the other hand, in monopoly markets, the company's management may be obliged to show the government that it has achieved a good profitability, and consequently such a company could not build up a strong financial position.

Baker (1965, p.886) attempted to overcome the problem by devising a set of formulae which take into account both premium income and the insurer's financial strength.

According to Kenny (1957, p.20) the financial situation of an insurer can best be measured by comparing the insurer's policyholders' surplus with his potential claims costs on business in

force.[1] Obviously the larger is the policyholders' surplus, the larger will be the proportion of any loss which the insurer can afford to retain for his own account. In the case of a property insurer it is appropriate to relate the policyholders' surplus to his unearned premium reserve, but for a casualty insurer Kenny argued that generally it is preferable to make the comparison against written premiums for two reasons. Firstly, many policies are written on a deposit premium basis, being earned at the time of collection. Therefore different insurers can have substantially different unearned premium reserves while having similar outstanding liabilities, depending entirely on how each writes and books his business. Secondly, the unearned premium reserve can be affected by the existence of short-term business of less than one year (e.g. motor insurance). Employing these two standards, and if unearned premiums are calculated without any deduction for pre-paid expenses, the target ratios of policyholders' surplus to the unearned premium reserve of a property insurer should be 1:1 according to widely accepted American market conventions, and against the written premium income of a casualty insurer the ratio becomes 1:2.

On the basis of such measures of financial strength Baker devised the following formulae for calculating retention limits

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(1) Policyholders' surplus is defined as "That part of the assets of an insurance company that is available for the benefit of policyholders". Whilst unearned premium reserves is defined as "A fund kept by a non-life insurer to provide for claims that may arise in the future under insurances that are still in force. It was formerly common to reserve 40% of premium income but in direct insurance more exact methods now prevail, e.g., the reserving for each insurance in force of 1/365 of the premium for every day that the insurance has still to run". (Cockerell, 1980, pp. 145 and 196).

for an insurer writing only one class of insurance:

Property Insurer Model:

$$\text{Net Retention} = \frac{X\%(S)\ (EP)}{(UPR)}$$

Casualty Insurer Model:

$$\text{Net Retention} = \frac{2\ X\%\ (S)\ (EP)}{(WP)}$$

Where EP = Earned premium income

UPR = Unearned premium reserve

S = Policyholder's surplus

WP = Written premium income

The factor of 2X% (instead of X%) is used for the casualty insurer because of the desired 2:1 relationship between written premiums and surplus.

Baker further pointed out that the insurer's loss ratio and expense ratio should be taken into consideration when fixing its retention limits because a company that is earning underwriting profits, as signified by a combined (claims plus expense) ratio to written premiums of less than 100 should be capable of financing larger losses than one operating at a loss with a combined ratio exceeding 100. Therefore if an underwriting capability factor of $\frac{100}{(L+E)}$ is added to the equations the two models become:

$$\text{Property Insurer Retention} = \frac{X\%(S)\ (EP)\ \ (100)}{(UPR)\ (L+E)}$$

$$\text{Casualty Insurer Retention} = \frac{X\%\ (S)\ (EP)\ (100)}{(WP)\ \ (L+E)}$$

Where L = Insurer's loss ratio for period under consideration.

E = Insurer's expense ratio for period under consideration.

In the case of insurers writing more than one class of insur-

ance business Baker recommended that a total retention limit should be fixed for all of the classes that may in the ordinary course of events be involved in one loss producing event. Therefore he further developed the model by assuming that each separate class of insurance has a claim on the surplus protection proportionate to its relative size in the portfolio. Under this assumption the individual class retention limits derived above would be multiplied by the factor of $\frac{EL}{EP}$, as follows:

$$\text{Property Insurer Retention} = \frac{X\%\ (S)\ (EL)\ (100)}{(UPR)\ \ (L+E)}$$

$$\text{Casualty Insurer Retention} = \frac{2X\%\ (S)\ (EL)\ (100)}{(WP)\ \ (L+E)}$$

Where EL = Class earned premium

The following examples will illustrate how the above formulae operate:

Assume two insurers with the following premium incomes:

		Property insurer £	Casualty insurer £
	Written premiums (WP)	1,000,000	1,000,000
+	Unearned premium reserve (UPR) at beginning of year	450,000	360,000
		1,450,000	1,360,000
-	Unearned premium reserve (UPR) at end of year	500,000	400,000
	Earned premium (EP)	950,000	960,000
	Loss and expense ratios (L + E) : (a)	99%	98%
	(b)	103%	104%

If we assume that each insurer holds policyholders' surplus amounting to £450,000, and the value of X% is 5 per cent, the insur-

er's respective retention limits will be:

Property insurer model

Situation (i) premium income, etc. as above:

$$\text{Retention} = \frac{0.05 \times 450{,}000 \times 950{,}000}{500{,}000} = £42{,}750$$

Situation (ii) if the insurer increases premium income without increasing policyholders' reserves, the retention will be reduced as follows:

Property (Year 2): W.P.	£1,200,000
+ U.P.R. at beginning of year	500,000
	1,700,000
- U.P.R. at end of year	600,000
E.P.	1,100,000

$$\text{Retention} = \frac{0.05 \times 450{,}000 \times 1{,}100{,}000}{600{,}000} = £41{,}250$$

Taking the loss and expense ratios into consideration the retention limit in situation (i) becomes:

$$\text{Retention (a)} = \frac{0.05 \times 450{,}000 \times 950{,}000 \times 100}{500{,}000 \times 99} = £43{,}182$$

$$\text{Retention (b)} = \frac{0.05 \times 450{,}000 \times 950{,}000 \times 100}{500{,}000 \times 103} = £41{,}505$$

Casualty insurer model

$$\text{Retention} = \frac{2 \times 0.05 \times 450{,}000 \times 960{,}000}{1{,}0000{,}000} = £43{,}200$$

$$\text{Retention (a)} = \frac{2 \times 0.05 \times 450{,}000 \times 960{,}000 \times 100}{1{,}000{,}000 \times 98} = £44.082$$

$$\text{Retention (b)} = \frac{2 \times 0.05 \times 450{,}000 \times 960{,}000 \times 100}{1{,}000{,}000 \times 104} = £41{,}538$$

Property and casualty insurer model

By merging the two insurers the combined policyholders' surplus S becomes £900,000 and the total EP is £1,910,000; thus the insurer's

retention will become:

Property insurer retention =

$$\frac{0.05 \times 900{,}000 \times 950{,}000 \times 100}{500{,}000 \times 99} = £86{,}364$$

Casualty insurer retention =

$$\frac{2 \times 0.05 \times 900{,}000 \times 960{,}000 \times 100}{1{,}000{,}000 \times 98} = £87{,}273$$

The retentions of the above two formulae would be multiplied by their respective class EP/Total EP and added together to produce the combined retention limit as follows:

$$£86{,}364 \times \frac{950{,}000}{1{,}910{,}000} = £42{,}956$$

$$£87{,}273 \times \frac{960{,}000}{1{,}910{,}000} = \underline{£43{,}865}$$

£86,821

There are various criticisms one could make of the formulae but they do attempt to improve on the simple rule of thumb that expresses the retention limit simply as X% of premium income. It divides the result of X% (S) (E.P.) by:

(i) a measure of financial strength UPR, which shows by what factor potential claims on business in force (UPR) exceeds surplus.

(ii) the underwriting performance of the company as measured by its combined ratio L + E.

So the lower the company's financial strength and the poorer its performance, the more the RL is reduced. One major failing of Baker's work is that he gives no recommended value for X%. Also although it does improve on the simpler rules of thumb there are many factors not accounted for (e.g. the potential fluctuations

in the insurers' claims costs, the quality of the insurers' investments, inflation, etc.) but the models required to handle such additional variables inevitably become far more complex and require far more data.

9.3.5 Premium Rates and Premium Loading

It is widely accepted practice for insurers to grade retention limits according to degree of risk as measured by premium rates, with the retention limit being inversely related to the premium rate, so that the lowest rated risks carry the highest retentions. Obviously a high risk premium may be required either on account of a high loss frequency or a high average claims severity, or due to a combination of both. Although there are exceptions to this practice, there is a case for retentions being governed by premium rates but not in such a simple manner: this point will be discussed in Chapter eleven so here it is proposed to consider only the loading of risk premiums to cover:

(i) expenses (including commission);

(ii) profit; and

(iii) the contingency of claims fluctuations.

The profit and contingency loadings are to provide for an expected profit and some protection against fluctuations in claims costs.

In his discussion of reinsurance theory, Benjamin (1977, p.224) derives the following 'very approximate but practical rule' for determining an insurer's retention limit M:

$$U_t = 2\sqrt{P_t.M} - \lambda P_t$$

where

U_t = the amount of the insurer's free resources (i.e. capital and free reserves) which can be called upon at time t;

P_t = the (risk) premiums required to time t to cover the expected claims cost;

λ = the premium loading required to service the insurer's capital.

From the equation he draws two conclusions. First, as already observed from the Baker formula, "if premiums increase without any increase in the free reserves, then the retention limit must fall", and secondly "if the reserves and premiums are correspondingly increased (in the same ratio) the retention limit can rise".

The influence of the premium loading λ on the retention limit M becomes clear by re-arranging the equation as:

$$U_t + \lambda = 2\sqrt{P_t \cdot M}$$

An increase in λ would add to available resources and thus would enable the insurer to increase M.

Carter (1979 , p326) has pointed out that competition has a real effect on the loading of premium rates which a company can charge, the more competition for the same business, the narrower the loading is likely to be. Thus the size of the loading varies between companies and classes of insurance, and consequently a company will determine different retentions for different classes of business. It would be sensible to consider that the same approach applies for different kinds of risk within a certain class. This situation, in fact, is not confined to a competitive market; even

in a monopoly a company cannot ignore the effectof the size of premium loading on the demand for different classes of insurance.

9.3.6 The Cost of Reinsurance

Reinsurance is an important input for an insurance company enabling it to control its portfolio risk, i.e. the potential adverse fluctuations in aggregate claims. However its purchase does involve a cost which has to be balanced against the reduction in risk. Therefore in fixing retentions the price of reinsurance is an important factor.

Every company purchasing reinsurance knows that its claims experience will affect both its retention limits and the price of reinsurance. For example, following adverse loss experience on an excess of loss treaty the reinsurer will usually increase the required premium. The only alternative then available to the ceding company will be to agree to a higher retention limit than it otherwise might have considered desirable. For example, one Arab insurance company three years after the inception of its motor excess of loss treaty ,found that it had produced considerable losses to the reinsurers. Consequently at renewal the leading reinsurer required either an increase in the premium rate from 3.5 per cent to 8.0 percent, or a more than twofold increase in the treaty deductible. The company decided to accept the higher retention limit rather than an increase in the rate.

From the reinsurer's point of view, it is never acceptable to provide coverage at a price sufficient only to cover the actuarial

value of the anticipated claims transferred by the direct insurer. He will require a loading of the reinsurance premium to cover the cost of general expenses, fluctuation in loss experience, and profit. It is even possible that the loading may exceed the risk premium when the coefficient of variation of the expected claims cost of the reinsured portfolio is high (Carter, 1979, p.326).

9.3.7 The Claims Experience

Past claims experience is likely to influence an insurer's decisions regarding the size of his retention limits, and thus the proportion of his gross premium income which he will be able to retain for his own account, in a number of ways. As noted above it will affect the price and/or amount of reinsurance which reinsurers are prepared to offer. Also the more limited is an insurer's claims experience the more conservative he should be in his retention policy, because the degree of accuracy that can be achieved in estimating future claims costs is directly related to the amount of data available regarding claims frequencies and severities.

The simplest measure of claims experience, which even the smallest insurer can employ, is the claims ratio; that is, the ratio of the aggregate cost of claims incurred in a given period to the premium income for the same period.(1) The ratio may be measured either for the gross account or net of reinsurance premiums

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(1) In practice the calculation of claims ratios is severely complicated by delays in the reporting and settlement of claims, the need to estimate outstanding claims, etc., so that less than perfect data often has to be used. See G.B. Hey (1970)

and claims recoveries. By calculating its gross or net (of reinsurance) claims ratios the managers of an insurance company can observe both the degree of fluctuation over time in aggregate claims costs relative to premium income, and how effective are its reinsurance arrangements in reducing the size of those fluctuations on its retained account compared with the gross account.

The relative size of the fluctuations in gross claims ratios over time will tend to vary with the size of the account as measured by premium income. Therefore in order to keep the fluctuations on the retained account within acceptable limits, as shown earlier in section 9.3.3, the smaller is the gross premium income the lower must be the retention limit and so the proportion of the gross premium income which the company retains for its own account. An examination of the claims experience of the Iraqi market supports the results of Baker's retention limit equation and Carter's hypothesis (1979, pp. 30-31) that if a company writing more than one class of insurance fixed one retention limit applicable to all classes of business written instead of fixing separate limits for each class, it would be able to carry a higher limit and thereby retain more of its gross premium income.

Table 9.1 shows the gross claims ratio of the total non-life business of the Iraqi market written by the National Insurance Company during 1971 to 1977, and Table 9.2 shows the breakdown for the individual main classs of business plus the proportions of the gross premiums which the company retains for its own account. As can be seen from Table 9.3, the relative fluctuations in the claims

ratios for the individual classes, as measured by the co-efficient of variation, are in every case higher than for the total non-life business.

Table 9.1

Gross Claims Ratios for Total Non-Life Business in the IraqiMarket

Year	Gross Claims Ratios %
1971	66.0
1972	88.3
1973	67.5
1974	43.9
1975	66.8
1976	82.0
1977	101.6
Average ratio	73.7%
Standard deviation	18.7%
Co-efficient of variation	25.4

Source: Compiled from the Annual Reports of the National Insurance Company - Iraq.

Table 9.2

Gross Claim Ratio and Net Retained Premium Income Applying to the Non-Life Business of Iraqi Market: Figures in Percentage of Gross Premium Written

Year	Overall Business	Marine Cargo		Hull		Aviation		Fire		Motor Compulsory		Motor Comprehensive		Engineering		Miscellaneous	
	rpi	gcr	rpi	gcr	rpi	gcr	rpi	gcr	rpi	gcr	rpi	gcr	rpi	gcr	rpi	gcr	rpi
1971	28.9	66.2	18.2	118.9	-	181.2	(12.5)	37.0	25.6	80.3	74.2	41.2	74.8	83.8	3.8	48.8	56.8
1972	33.0	123.6	24.1	117.0	(3.0)	45.2	3.0	20.2	26.5	78.6	73.9	46.0	73.8	126.0	5.6	87.8	54.1
1973	30.4	72.6	20.8	92.1	3.1	101.3	2.4	20.8	24.2	87.6	73.6	45.4	74.1	125.3	7.1	56.1	58.1
1974	25.1	39.0	21.9	81.6	2.5	90.2	3.8	20.9	23.7	113.1	74.3	42.1	74.7	42.8	2.2	47.7	60.0
1975	28.9	52.2	20.4	85.8	4.1	81.5	4.8	47.6	30.7	117.7	74.7	46.5	74.8	140.8	14.5	27.9	57.4
1976	30.7	87.2	24.1	65.7	1.4	38.7	2.4	75.1	29.7	149.6	74.7	56.1	74.7	99.7	3.7	22.0	56.3
1977	28.9	106.0	26.4	54.5	6.7	202.1	7.2	60.2	27.3	229.4	74.7	134.4	74.7	100.3	5.2	14.0	60.5
Average ratio		78.1		87.9		105.7		40.3		130.9		58.8		102.7		43.5	
Standard deviation		26.9		25.1		68.1		22.0		57.8		39.9		26.3		23.9	

Source: Compiled from the Annual Reports of the National Insurance Company of Iraq.

gcr = gross claims ratio

rpi = $\frac{\text{net retained premium income}}{\text{gross premium written}}$ 100

Note: Standard deviation is calculated according to the following formula adopted from Gerathewohl (1980, p.166):

$$\sigma = \sqrt{\sum \frac{GP_i}{GP} (r_i - \mu)^2}$$

GP_i = gross premium in year i.

GP = gross premium in the period observed.

r_i = claims ratio in year i.

μ = average claim ratio in the period observed.

Table 9.3

Summary of Table 9.2

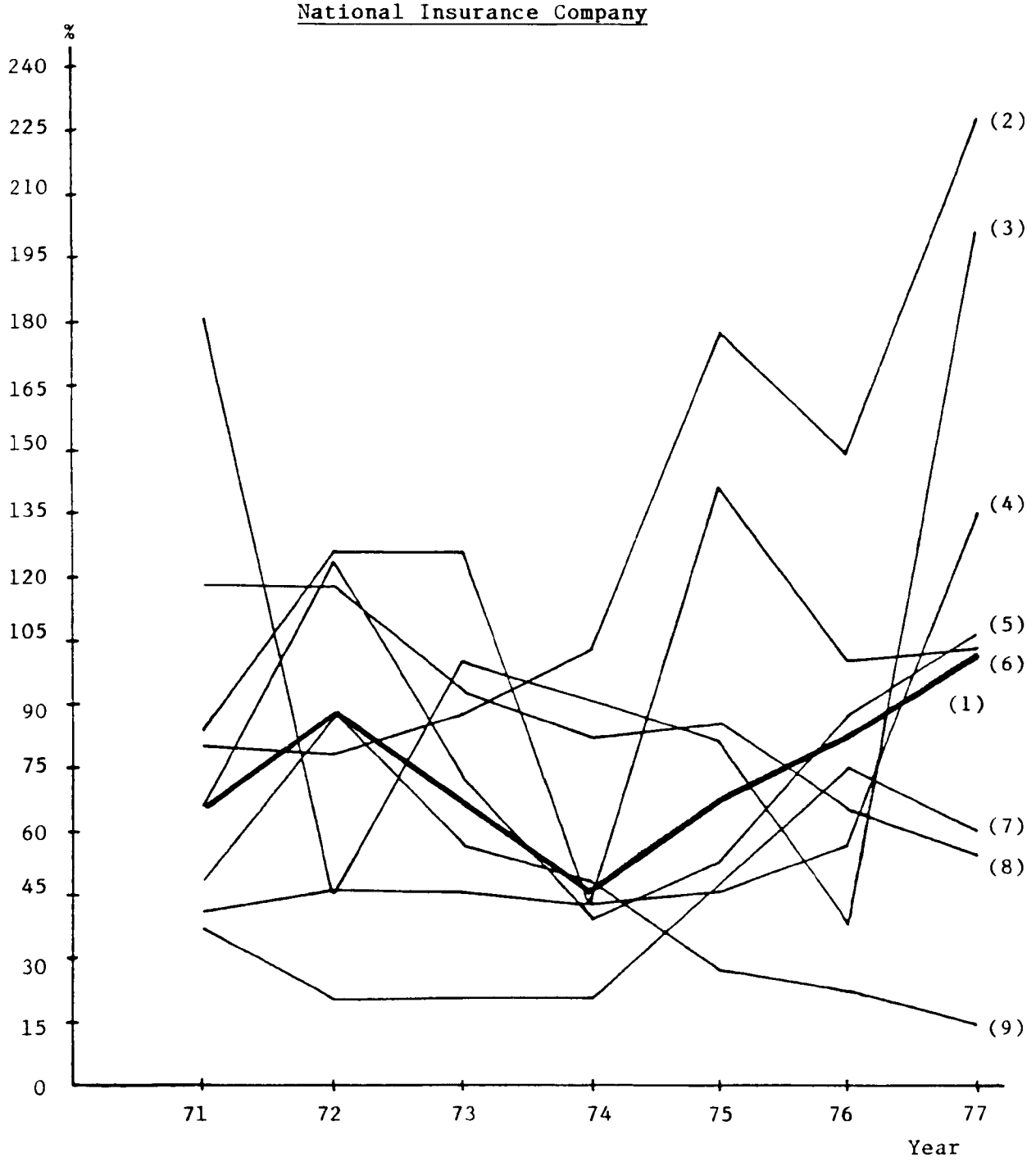
Class of Insurance	Gross claims ratio for class			Aggregate underwriting result for period	Ratio of retained to gross written premiums compared with overall average
	Average ratio	Standard deviation	Co-efficient of variation		
Marine cargo	78.1	26.9	34.4	Profit	Below
Hull	87.9	25.1	28.6	Profit	Below
Aviation	105.7	68.1	64.4	Profit	Below
Fire	40.3	22.0	54.6	Profit	Below
Motor (compulsory)	130.9	57.8	44.2	Loss	Above
Motor (Comprehensive)	58.8	39.9	67.9	Profit	Above
Engineering	102.7	26.3	25.6	Profit	Below
Miscellaneous	43.5	23.9	54.9	Profit	Above

Note: Underwriting results have been taken from the annual reports of General Insurance Organisation of Iraq.

Figure 9.2

Gross Claims Ratios for Overall and Individual Class(es) of Insurance

National Insurance Company



Source: Tables 9.1 and 9.2.

(1) Overall Claims Ratio.
(2) Motor Compulsory.
(3) Aviaton.
(4) Motor Comprehensive.
(5) Marine Cargo.
(6) Engineering.
(7) Fire.
(8) Marine Hull.
(9) Miscellaneous.

Apart from engineering business, the marine cargo and hull classes have both shown lower co-efficients of variation in their claims ratios than other classes, and profitable underwriting results (see figure 9.2 and Table 9.3). Marine cargo business represents more than 50 per cent of the whole premiums written in the market, yet it has a net retained premium income lying below the average for the total business.(1) The retained premium income for marine hull business is very small due to first, the number of insured vessels being limited and, secondly, the size of risks being relatively large.

Aviation business has the second highest co-efficient of variation (64.4%), and like the hull business, it has a net retained premium income far below the average, though during the period it produced an aggregate underwriting profit.

Fire had the lowest average claims ratio, and during 1971-77 its overall business result was profitable, yet its retained premium income proportion was below the overall average.

The retained premium income for both classes of motor business was far above the overall average partly because both accounts were protected by excess of loss covers which leave the ceding company with a higher proportion of the gross premium income than do proportional reinsurances. However, there were other factors involved. In the case of motor comprehensive business, which yielded an underwriting profit taken over the whole period, the company could afford

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(1) "In this context the level of retention in a class of busines should decrease as the share of that class in a company's overall premium volume increases." (Gerathewohl, 1980, p.167, footnote 81).

to retain for its own account the bulk of the accidental damage claims which account for a high proportion of the total claims costs. The company's retention limit on motor compulsory business would have been forced up by the adverse claims experience which was due to premium rates having been increased insufficiently to compensate for the increases in:

(i) the number of claims, which for all motor business rose from 4366 in 1971 to 18142 in 1979; and

(ii) the size of third party claims due to inflation and increased claims consciousness.

The Engineering business, which includes CAR, EAR and a few boiler and machinery breakdown covers, has the third lowest net retained premium income over the whole period. The reason is because the class of business is still new and the portfolio includes a number of large risks. Engineering business also shows the lowest co-efficient of variation and a profitable result.

The miscellaneous insurance class retained premium income is far above the average for overall business. Although the claims ratio fluctuations were relatively high, ranging between 14.0 per cent in 1977 and 87.8 per cent in 1972, its average claims ratio was the second lowest.

To determine the proper level of retention, the insurer must examine the size and frequency of loss for each class. Methods of calculating these factors will be shown in Chapter eleven. However, on the basis of the National Insurance Company's claims experience for the individual classes, a strong case could be made for

it considering fixing one retention limit for all classes of business, with the possible exception of motor insurance due to the nature of that business and the substantial underwriting losses incurred on the compulsory motor account.

9.3.8 Investment Policy

A company in deciding on its investment policy should pay regard to the likelihood of having to pay claims which it may not be able to meet from its normal cash flow, so that it will need to maintain a certain level of liquidity. The higher its retention limits and so potential retained claims costs, the more liquid funds it will require. Therefore investment policy and retention limits are interrelated, as implied by the Swiss Reinsurance Company in their rules of thumb for fixing retentions (see Section 9.3.4).

Whether insurance companies do consider investment policy in fixing their retention limits is a moot question. However as both are matters decided by top management, it is likely that the investment factor is taken into consideration when fixing the level of retention.

9.3.9 Experience of the Company's Staff

Reference was made in Chapter five to the shortage of experienced trained staff in the Arab insurance and reinsurance companies. Such lack of skill adversely affects their ability to correctly determine retention limits, and requires management to adopt a more

conservative retention policy. When experienced and qualified staff have the ability to underwrite risks and fix premium rates reasonably accurately, a company is in a position to retain a higher proportion of the risks which it underwrites in that it can have greater confidence in available funds being adequate to meet claims, which also should be subject to smaller fluctuations in their total cost.

9.4 Characteristics of Class of Business in Relation to Retentions Per Risk

There are certain characteristics in the nature of marine cargo, marine hull, aviation, fire, motor, and engineering insurances which are worth a brief comment.

9.4.1 Marine Cargo Insurance

In marine cargo insurance there is a basic choice between fixing a retention per policy or per vessel (this point will be discussed in Chapter 11).

The structure of the portfolio plays an essential role in determining the retention limit. The concentration of cargo values is, indeed, constantly increasing with the development of new and larger ships. To an increasing extent, for instance, large industrial projects are nowadays shipped to Arab countries, and are usually insured only with one, or perhaps a few, national insurers, thus resulting in a less balanced portfolio, and, consequently, more exposure to large losses.

One must also take into account, when fixing the retention limits, possible accumulations of values at risk on one vessel or

at the docks, the means of transport, the type of vessel, the quality of merchandise and its packaging, and the type of cover.

9.4.2 Hull and Aviation Insurance

In marine hull insurance the original premium rates may encourage companies to maintain a higher retention limit if they believe that the pattern of results obtained in their own markets are better than the world average (Kingsbury, 1980, p.7). The retention varies according to factors such as size and value of the insured vessels, classification, flag, age, owner, and fleet (large or small). The main reason, however, for fixing a small level of retention, particularly in Arab countries, is that the hull portfolio contains few individual units coupled with a high value per unit: port accumulation risk is another factor. Therefore the portfolio tends to be less stable than most non-life insurance business.

The aviation portfolios of Arab companies comprise mainly relatively few airliners operated by the national airlines. Consequently their retention limits are low given the very high combined hull and liability limits required for such aircraft compared with the companies' total aviation premiums.

9.4.3 Fire Insurance

There are a number of factors which affect retention limits for individual fire risks, such as the location of the risk, its construction, occupation, contents, etc. The additional covers,

such as earthquake, flood, hurricane, etc., also affect the determination of retention limits.

Unlike large insurers in developed countries, the fire portfolios of Arab insurers do not contain large numbers of small to medium sized independent risks. Instead a large proportion of their premium income is derived from large risks, so making their portfolios badly unbalanced, and thereby, limiting their retention capacity relative to gross premium income.

Instead of basing retention limits on sums insured, fire insurers frequently operate on estimated maximum losses (EML's). As noted in Chapter 5, the danger then lies in the under-estimation of the EML.

9.4.4 Motor Insurance

Motor business is characterised by relatively uniform sums insured for own damage covers, and the limits of third party liability covers are also uniform within one market. Although motor portfolios in Arab countries include a large number of homogenous risks, the main problem in this class of business is the level of the original premiums relative to the claims costs and general expenses.

Throughout the world, but especially in the developing countries, motor business is one of the branches of insurance most subject to political interference in that governments are conscious that it affects a large part of the general public (Kingsbury,1980, p.4). In many Arab countries government intervention makes it

difficult for insurers to raise motor premiums, especially for compulsory motor insurances, to levels sufficient to offset increases in their claims costs during periods of inflation. Given the unwillingness of reinsurers to subsidise national motor portfolios by sharing in the resulting underwriting losses, many Arab insurers are forced to carry higher retention limits than they would prefer.

9.4.5 Engineering Insurance

In Engineering insurance, the level of retention has to be determined, in a large number of cases, on an individual basis, taking into consideration the special characteristics of each risk.

More common factors are the type of cover (i.e. EAR, CAR, MB), the location of the risk and the sum insured. The latter factor forms the main problem in this branch of insurance, because of the disproportion which exists between the sums insured in the different engineering risks (Swiss Re, 1980, pp.52,and 198).

Retention limits are usually based on sums insured for engineering insurances. Although with the aid of highly qualified technical staff an insurer in principle ought to be able to work on the basis of EMLs, such a practice is not considered desirable by some leading insurers in that it involves arbitrary decisions which could leave both the insurer and his reinsurers badly exposed to loss (Gerathewohl,1980, p.161).

9.5 Accumulation Risks and Retention Limits per Event

Insurance portfolios can be exposed to accumulations of losses as the result of one loss producing event affecting two or more risks either within one class of insurance or involving perhaps several classes of insurance. As discussed in Chapter six, major loss accumulations may arise from the operation of natural hazards, but there can be other causes.

9.5.1 Accumulation within one Class of Insurance

There are two factors involved in the consideration of retentions: (i) the retention per risk; and (ii) where there is any interdependence between individual risks, the retention per loss event. If the individual retentions are determined according to the company's financial strength and the anticipated fluctuation of its business results, and if the maximum retention per risk represents a high proportion of the net retained premium income, then the total amount of money to be paid as a consequence of one loss event may severely affect the company (Gerathewohl, 1980, p.154).

As explained below, the main classes differ in their degrees of exposure to accumulations of losses from one event, which is one reason why insurers vary their retention limits by class of insurance.

Fire Business

Fire portfolios can be exposed to accumulations of losses

affecting:

(i) two or more material damage risks; e.g. due to conflagrations or explosions in inner city areas;

(ii) material damage and ensuing loss of profits for the same policyholder(s);

(iii) loss of profits for two or more policyholders; e.g. customers and suppliers.

The second type of accumulation is common and can be handled by scaling down the per risk retentions. For example, where an insurer insures both risks for the same policyholder, it is common practice to reduce the loss of profits retention to 50 per cent of the corresponding material damage retention limit.

If a portfolio is exposed to possible accumulations of losses arising from conflagrations or natural hazards, besides fixing per risk retentions the insurer will also need to arrange a retention limit per event. The balance of any accumulation of losses can then be covered by catastrophe excess of loss reinsurance.

Marine Cargo Business

Possible causes of accumulations of losses may be classified as follows:

(i) Several cargoes on one vessel.

(ii) Several cargoes in one dock and/or warehouse.

(iii) Cargoes on two or more vessels.

The first type of accumulation is common and is the reason for cargo insurers often preferring to fix their retention limits on the basis of "per bottom" rather than 'per policy'. Apart from

the remote risk of collisions at sea the other main accumulation risks occur at ports of departure and destination. Due to the increasing demand for consumer and investment goods in the Arab World in recent years, particularly by the oil producing countries, cargo amounting to a total value of many hundreds of millions of US$ is stored in the warehouses and storage yards of the countries' ports. Since most of these ports, coupled with the poor quality of roads and transport systems, do not have sufficient capacity to cope with such huge amounts of goods and are not capable of shipping them without delay, the accumulation risk has rapidly increased in recent years. Therefore cargo insurers need to fix retention limits per event for the purpose of effecting catastrophe excess of loss covers.

Marine Hull Business

The accumulation of several hulls due to a collision or a seizure (in the case of hostile events) is quite possible. A well-known example in this context is the war between Iran and Iraq, which, as a consequence, has trapped many ships in the Iraqi port of Basra. The main accumulation risk for a hull underwriter is in connection with war risks, though the port risk can also be important for an insurer covering national fleets operating from congested ports.

The other major accumulation risk for the marine insurer is that of being involved in a loss affecting both hull and cargo whether insured for the same or different interests.

Aviation Business

In aviation, following a crash involving one plane, accumulation may arise through loss of hull, passenger legal liability, cargo legal liability, third party legal liability, and accident policies. Under such circumstances the accumulation risk may result in losses of many million of US$. It may also be possible that a major accumulation could arise when several aircraft are on the ground, at one place, and damage occurs to more than one aircraft insured by an insurer; e.g. the Tenerife disaster which involved two jumbo jets.

Motor Business

Apart from vehicle damage claims arising from natural hazards, e.g. windstorm, flood and hail, and fleets of vehicles being garaged together, the risk of an insurer incurring claims for two or more vehicles being involved in the same incident is directly related to the size of its market share. In other words, a monopoly insurer will have an accumulation of claims from every collision or other incident involving two or more vehicles. The main accumulation risks are, however:

(i) vehicle damage plus liability claims arising from the same event; and

(ii) multiple liability claims, especially in connection with buses and coaches.

9.5.2 Accumulations Between Various Classes

Simultaneous accumulations of losses from several classes

of business are very infrequent, but are possible. A hurricane, for instance may affect fire, business interruption, personal accident, EAR, CAR, motor own damage, marine, life and conceivably even credit insurance policies. In such cases, the losses which derive from different types of insurances may have a major effect on a company's annual results and will no doubt, be much greater than in case of loss accumulation in one class only (Gerathewohl, 1980, p.155).

In the above example, it is impossible for an insurer to know in advance the impact of such catastrophic events on various retentions in respect of numerous risks in different classes covered by him. The insurer must always check, when fixing retentions, whether several, independent classes of insurance may be affected by one event, thus creating a loss accumulation. Therefore the insurer may need to compile a classification list of classes in which accumulations are likely to occur, and then adjust the retentions according to this list. From an empirical point of view, it is difficult to reach an accurate calculation in this respect. Carter (1981, p.1/7) argues that to a large extent the problem of identifying and measuring accumulations from a single occurrence has not yet been solved. Qualified companies will do their utmost to quantify such accumulations, while unqualified companies will disregard this potential with possibly ruinous consequences either for themselves, or for their reinsurers, or for both.

The conclusion to be drawn is that companies may prefer to arrange a catastrophe excess of loss cover that operates when losses resulting from one event affect more than one class of insurance: i.e. an umbrella reinsurance. If arranged in addition to separate

catastrophe excess of loss covers for the individual classes of insurance, the purchase of an umbrella reinsurance will enable the insurer to limit to a pre-determined sum its aggregate net retained losses arising from one event which affects two or more classes of insurance. Thus, as Carter has pointed out (1981, p.2/4), the insurer then will be able safely to fix the retention limits for the underlying separate catastrophe covers at levels which are as high as is appropriate to the needs of the individual classes of insurance. The difficulty is to establish the correct retention and upper treaty limit for the umbrella insurance.

9.6 Conclusions

The fixing of retention limits is one of the most difficult problems facing the management of an insurance company because of the number of factors that need to be taken into consideration, including the differing characteristics of the various classes of insurance business and the distinction between loss events affecting one or more individual risks. As shown in this chapter, the relationships between the various factors and the appropriate retention limits differ, in some cases being direct and in others inverse, so that to date there has been developed no widely accepted mathematical model which insurers can use to solve the problem. An approach gaining in popularity is the use of computer simulation models, such as the model outlined in the Boleslaw Monic Fund prize-winning papers Net Retentions (1981) but many insurers still lack all of the data required to make use of them, and management must still choose between alternative policies with differing reinsurance

costs and probabilities of ruin. Thus whatever system may be employed to fix retention limits, management attitudes are of paramount importance.

A second point is that the retention limits chosen will have an important influence on the attainment of an insurer's corporate objectives. That issue will be explored more fully in the following chapters.

CHAPTER TEN

CORPORATE OBJECTIVES AND THE DETERMINATION OF RETENTION LIMITS - GENERAL THEORY OF RETENTION

10.1 Introduction

The main role of top management is to decide on their companies' objectives and to pursue the policies necessary for their attainment. Exactly what those objectives may be can differ from one company to another depending on the company's type (e.g. state or privately owned, proprietary or mutual), its size and the nature of the market in which it is operating. Any discussion involving the corporate objectives of companies encounters three difficulties:

(i) whether a company's controllers and managers have clearly defined their objectives;

(ii) the potential conflicts between possible objectives, which leads to the distinction between primary and secondary objectives; and

(iii) the differences between companies in their chosen objectives.

In all of these respects, of course, insurance companies are no different from companies operating in other industries.

Increasingly insurance and reinsurance companies, especially if operating in competitive markets, are beginning to realise that the definition of clear, realistic objectives is of paramount import-

ance.[1] One of the primary duties of top management is to determine the company's objectives and select the appropriate strategies by which to achieve them. This is not only necessary for the growth and profitability of the company but may even be vital for its survival.

When companies have defined their objectives, the next step is to decide on the prime objective. Does it, for example, wish to achieve maximum profits, or to maximise the growth of gross premium income, or to maximise the growth of retained premium income, or to increase its market share? Many questions like these need to be answered before a comprehensive corporate strategy can be formulated. The underlying principle is that all objectives are interdependent and none can be set in isolation. But one should realise that objectives may change in emphasis over a period of time. For example, the management of a new company may seek to maximise profits in order to build up reserves; later it may merely attempt to maintain a satisfactory profit.

How management can achieve a continuous growth in the amount of business written is one matter: how much of that business it reinsures is another. The latter problem is often complicated by the limited information available for selecting the best reinsurance programme. Equally, the company may not understand the advantages and disadvantages of each type of reinsurance and the cost implications of selecting one type over another. Unless the programme and

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(1) "Since 1863, the inception date, until 1970 Swiss Re did not have formal volume objective, no formal objectives and no budgeting existed." (Odermatt, 1978, p.11).

cost of reinsurance are clearly understood in the decision making process, the company may decide on the wrong plan, which might prove an extremely costly mistake.

The most difficult problem in reinsurance programming is the determination of retention limits. Obviously, if the retention limits are too low, unnecessary reinsurance will be taken out, while if these limits are too high, unexpected fluctuations in claims costs and therefore in earnings may occur. This chapter seeks to provide a comprehensive discussion of: (a) the utility theory of retentions, (b) an examination of the findings of a questionnaire designed to discover what insurance and reinsurance companies in the Arab World see as their prime objectives, (c) some possible objectives, namely: profit target, production target, market share and solvency margin, and how insurance companies seek to achieve them, and (d) the implication of these objectives for retention limits.

10.2 A General Review of Corporate Objectives and Retention Limits

10.2.1 Key Corporate Objectives and Retention Limits

Among the objectives which insurance companies may pursue four are of major importance, namely:

Profit Target

Economic theory indicates that the point of maximum profits is where marginal revenue equals marginal cost. Many economists,

however, warn that profit maximising is not an operational concept since it cannot be defined. Thus, in recent years, there have been several alternative theories of the firm, including the theory that confronted by many uncertainties, firms tend to be 'satisficers' that is they seek to attain not maximum but satisfactory profits (Simon, 1955). That could well be true of insurance and reinsurance companies that have to operate in an environment where lack of certainty about the future makes it questionable whether profit maximising is ever the main objective and, indeed, whether it is an achievable objective.

Growth of Sales

Instead of trying to maximise profits a firm may try to maximise its revenue. An insurance company's revenue may be measured as either gross or retained premium income, though the two are related because unless an insurance company can achieve the growth of gross premium income it will not be possible to increase retained premium income unless it raises its retention limits. The latter is a very risky strategy because, as demonstrated in Chapter 9, it exposes the company to larger fluctuations in aggregate retained claims costs.

Market Share

A market share objective is closely related to the growth of sales: the higher are an insurer's sales as measured by gross premium income, the larger will be his market share. Therefore the same considerations apply to the fixing of retention limits,

particularly if the market share objective is expressed in terms of retained premium income.

One additional complication with pursuing an objective of increasing (or even just retaining an existing) market share is the difficulty of obtaining up-to-date information regarding the performance of the rest of the market. If the objective is based on retained premium income, competitors may quickly change their market positions by changes in their retention policies which may not become public knowledge for some time.

Solvency Margin

As the provision of security for policyholders is the function of an insurance company, so maintaining its own solvency ought to rank high amongst an insurer's corporate objectives. Changes in underwriting or reinsurance policy can directly affect the attainment of that objective. For example, a rapid increase in retained premium income at a time when underwriting plus investment earnings are falling or even static will result in the company's solvency margin also falling unless it is able to boost its free reserves by raising additional capital. So when underwriting results are deteriorating, or the value of free reserves are falling due to a decline in the market values of assets, an insurer may choose to reinsure a higher proportion of his potential claims liabilities. For example in 1983 when the Commercial Union was concerned about the substantial losses being incurred on its American business it opted to purchase a special stop loss reinsurance.

10.2.2 Competition and Corporate Objectives

Obviously, the objectives which have already been mentioned above are substantially affected by competitive forces which in insurance markets can take the following forms (Diacon, 1981, p.6/7).

1. Price competition.
2. Extent of cover.
3. In life assurance, type of profit bonuses and bonus rates.
4. Quality of service.
5. Rapidity of claims settlement.
6. Quality of underwriting.
7. Marketing policy.
8. Rates of commission paid to agents.

Item 1 and arguably item 8 are examples of price competition, whereas the remainder are forms of non-price competition. The latter may be divided into product and service competition. It is impossible within the scope of this study to offer more than a brief explanation of price and non-price competition and their relationship to corporate objectives.

10.2.2.1 Price Competition and Corporate Objectives

In many Arab countries, competition within the insurance industry continues to be intense, sometimes due to companies seeking to obtain premium income without proper assessment of the risks involved. This situation has been encouraged by reinsurers who

have behaved in a similar manner. Indeed, given such availability of reinsurance there are clear signs of an over-capacity almost everywhere, and this has increased at an even more rapid rate than the business available. Over-capacity, together with the economic recession and the availability of high interest rates, has resulted in vigorous competition for business. This has encouraged relentless price cutting and adversely affected profit margins. The more intense the competition and uncertainty in an insurance market, the worse tend to be the underwriting results.

If the cutting of premium rates to increase the volume of business written is taken to the point that an insurer's marginal revenue (i.e. premium income plus investment income) falls below its marginal costs, then both its operating profits, and ultimately its financial strength, will suffer. Today many Arab insurers and other insurers worldwide are in such a position, even though in many countries governments have the power to control the price competition in direct insurance.

Clearly insurers, like firms in other industries, cannot afford to pursue premium growth or market share regardless of the effect on profit and, ultimately, on financial stability.

10.2.2.2 Non-Price Competition and Corporate Objectives

Non-price competition in insurance takes two forms:

(i) product innovation, by providing improvements to the cover under standard types of insurance contracts available on the market, and by introducing new forms of

insurance; and

(ii) quality of pre- and post-sales service provided; that is, the efficient handling of proposals and claims, the provision of loss prevention services for policy-holders, etc.

Both forms can be highly effective in attracting business but they also add to costs, e.g. (a) generous claims settlements add to claims costs, and consequently affect underwriting results, and (b) loss prevention surveys add to expenses. Indeed there is much discussion nowadays about the need for insurers to unscramble the services they offer from the insurance product, and to charge for them separately.

Moreover, given the complex and subjective nature of insurance, together with a highly technical and unattractive commodity, the quality of the service and product provided by an insurance company may be more important than the price when choosing insurance. This argument, in fact, is to a large extent an empirical one, and not a theoretical question.

The above discussion may suggest that non-price competition in the quality of the product and service, as well as the price competition, may be the only really effective elements in achieving a company's prime objectives.

10.2.3 Corporate Objectives in Insurance Business

Ewing (1968, pp. 26-28) summarised the characteristics of good strategic objectives as follows:

1. Objectives must be specific;

2. Objectives should have a time scale;

3. Objectives must be consistent with one another;

4. Objectives must be based on facts, values and feelings about the facts; and

5. Objectives are hierarchical.

The above characteristics provide sufficient elements for conceptualising the determination of objectives. However, one further factor should be considered, that of the extent of the objectives. It may be better to determine comprehensive objectives for the whole company's activities than try to establish objectives for only a few activities. Robarts (1969, p.624), Chief General Manager of the Norwich Union Group, an organisation owned by a mutual life office, supports this general view and expresses that group's object-objectives as:

> "To offer as widely as possible to the public at home and abroad the benefits of competitive insurance terms for all classes of business at rates profitable to the group, to earn the highest possible bonus for participating life policyholders, to hand on to succeeding generations of policyholders an efficient and live organisation, with increased funds and surpluses, and to sustain an enthusiastic and effective staff at all levels by ensuring the best possible working conditions and remuneration, and full opportunities for promotion to the maximum of individual capability".

Two points can be made regarding such a set of objectives. First, as already argued, if a company adopts a number of objectives it cannot maximise them all, there must be trade-offs both between objectives and overtime. So, for example, the distribution of the highest possible rates of bonus to life policyholders in the short-run may reduce the returns over the longer-term. Secondly,

an organisation contains differing interest groups - the owners, employees and customers. Their objectives may conflict too; for example, large pay awards to insurance employees may raise a company's expense ratio so adversely affecting its policyholders' and/or shareholders' interests.

The latter point also raises the question as to whose interests management seeks to serve in setting the corporate objectives. Over the long-term there must be some degree of common interest between each of the interestgroups, but in addition to the possible objectives of an insurance company which have already been discussed one could add:

(a) dividend and asset growth objectives for shareholders; and

(b) price and service objectives for policyholders.

Not only may direct insurers differ in their corporate objectives, partly reflecting differences in the type of ownership, but also it is arguable that the objectives of reinsurance companies may differ to some degree from those of direct insurers.

In the case of a reinsurance company with shareholders, Frank (1982, p.129) has argued that its two main objectives should be (i) concern with the return on investment and (ii) solvency. Becke (1981, p.770) argues that the ultimate targets of a reinsurance company in most cases will combine profit expectation, volume of business, proper security, cash flow consideration, and solvency. The same could be said of a direct insurer, but the necessity to achieve a particular objective in a reinsurance company may not be the same as in an insurance company. For example, since a profess-

ional reinsurer is involved in reinsuring the higher layers of risk accepted by insurers, and because his reputation in the international reinsurance market, and thus his success, is directly related to his financial strength, the reinsurer requires a somewhat relatively larger solvency margin than insurance companies of similar size in terms of premium income. Today ceding companies and their advisers are certainly placing more emphasis on the security of potential reinsurers.

Some insurance experts refer to insurance company objectives as static, theoretical and unachievable. Their objectives are also subject to the criticism that they are not precise. For instance Borch (1967, pp. 581-591) has said that:

> "It is difficult to specify the general problems of an insurance company simply because the company as a general rule will be unable to make a precise statement as to what it really wants to achieve. We can search the whole literature of insurance, without finding an operational formulation of the aims or objectives of an insurance company".

That may have been true of the position in the 1960s, but it is less so today. An ever increasing number of insurance companies in both developed and developing countries are, for example, engaging in corporate planning when the formulation of corporate objectives is an essential part of the planning process. There remains the problem, however, of choosing between objectives and coping with the uncertainty of outcomes: that is where utililty analysis can help.

10.2.4 Utility Theory

Not only are the outcomes of any course of action uncertain, but also the managers and owners of a company may not necessarily

judge the satisfaction gained from differing outcomes as varying in proportion to their monetary values. For example, according to the hypothesis of diminishing marginal utility, a profit of, say, $2 million would yield less than twice the total utility (i.e. satisfaction) than that of $1 million. Also attitudes to risk differ, some people being far more risk averse than others, so that the management of an insurance company may prefer to pursue a policy which guarantees its financial security, even if it means sacrificing a chance of earning high profits by not adopting another course of action which also carried the risk of incurring large losses.

These are problems which can be handled by the use of utililty analysis. A suitable utility function is formulated to encapsulate the attitudes of the decision-makers, and then it is possible to determine mathematically the necessary conditions for maximising their total utility. Such analysis is largely of theoretical rather than practical use because of the difficulty in measuring an individual's utility values, though there are devices for doing so. However, it does provide more insight into the necessary conditions for attaining differing objectives as will be illustrated briefly below.

Three major decisions which the management of insurance companies have to take are:

(i) the size of the loading which can be built into its premium rates and how much money it should spend on its marketing activities if it wishes to increase its sales volume;

(ii) the reinsurance arrangements it should make in order

to reach an acceptable balance between expected profit and its financial security (e.g. as measured by its probability of ruin); and

(iii) the investment policy it should pursue in order to achieve the best possible return on its funds while still being able to fulfil its other objectives.

As far as the first point is concerned, clearly the size of premium loading affects the number of insurance policies which the company could sell. The larger the premium loading, the higher the insurance price, and the lower are likely to be its sales, and thus premium income. Borch (1974, p. 213) has pointed out that the choice of specific techniques can probably best be made in each particular case, depending upon the nature of the three functions namely: the claims distribution, the number of policies the company may be able to sell, the utility functions. The first function is far from fully known to any actuary, and the second is usually estimated by the sales manager or a market research department of the company. But the problem remains with the general shape of the utility functions about which little is known. He interprets this as follows:

> "the main reason for this lack of knowledge is that few companies are very specific when they make public statements about their policy. This may mean that companies simply do not have a well-defined policy. It may, however, also mean that companies consider their policy a business secret".

The second substantial point regarding an insurance company is that of the reinsurance arrangements. In this context, however, one might ask what objectives the insurance company ought to have

in its reinsurance policy. The purchase of reinsurance will enable an insurer to reduce the probability of incurring retained underwriting losses which may imperil its solvency but at the cost of a reduction in:

(i) its retained premium income; and

(ii) its expected total operating profit, because the reinsurer will require a premium greater than the loss expectancy reinsured.

Therefore in deciding upon its reinsurance arrangements an important consideration is its probability of ruin. When this probability is high, this will lead the company to consider reinsurance arrangements to bring the probability of ruin down to the required level. Each type of reinsurance arrangement has a different effect on the company's portfolio. Assume that a company wants to reinsure a quota κ of its portfolio. It is clear that the company's utility is affected by the value of κ, because for each value of κ there will be a different value of expected profit and probability of ruin. Therefore, that value of κ should be chosen which enables the highest expected profit to be achieved with the acceptable probability of ruin. This point can be illustrated by the following example taken from Borch (1974, pp 93-94) using table 10.1 below.

Assume that a company in the risk situation $(S,F(x))$ decides to reinsure a quota κ of its portfolio. For this reinsurance cover the company has to pay the net premium κP of the ceded quota, plus a loading $\lambda\kappa p$, thus the optimal quota will then evidently be the value of κ which maximises the expected utility of wealth:

$$\int_{0}^{\infty} U(S-(1-\lambda)\kappa P-(1-\kappa)x)dF(x) \qquad (1)$$

where F(x) = the probability that the total amount of claims being made under the contracts in the portfolio shall not exceed x.

S = the funds which the company holds and which it can draw upon to pay claims.

P = the risk premium of the whole portfolio, i.e.,

$$P = \int_{0}^{\infty} x dF(x)$$

Assume that

$$F(x) = 1-e^{-x}$$

and the utility function is given

$$U(x) = -ax^2+x+b$$

It seems that the above utility gives acceptable results when U(x) is increasing over the range of x values up to x=S; the constant a should be $< \frac{1}{2S}$. By substituting F(x) and U(x) in (1) and setting the derivative (with respect to κ)=0, we obtain the optimal value of κ that maximises the expected utility, and given by

$$\kappa = \frac{2a(1-\lambda)-\lambda(1-2aS)}{2a(1+\lambda^2)}$$

If for example a = 1/3, b = 0.135, S = 1.2, and λ = 0.1

We obtain

$$\kappa = 0.86$$

The third column of the table 10.1 gives different values of κ in (1). Taking now an example using κ = 0.8 and

$$P = \int_0^\infty x dF(x)$$

$$= \int_0^\infty x e^{-x} dx$$

$$= 1$$

Then

$$U\left(S-(1-\lambda)\kappa P-(1-\kappa)x\right) = U(0.32-0.2x)$$

i.e. $U = 0.421-0.1573x-0.0133x^2$

Substituting in (1), we obtain

U = 0.2368 the value of utility which corresponds to using κ = 0.8.

As mentioned earlier, different values of κ result in different values of expected profit and probability of ruin. Thus, for the same value of κ = 0.8, the expected profit and probability of ruin are computed as follows:

$$\text{Expected profit} = \int_0^\infty [S-(1+\lambda)\kappa P-(1-\kappa)x]dF(x)$$

from before we have P = 1, and the quantity in the brackets is

$0.32-0.2x$

$$\text{Therefore expected profit} = \int_0^\infty (0.32-0.2x)e^{-x}dx$$

$$= 0.12$$

To obtain the probability of ruin, we solve

$$S-(1-\lambda)\kappa P-(1-\kappa)x=0$$

We obtain

$$x = \frac{S-(1-\lambda)\kappa P}{1-\kappa}$$

$$= 1.6$$

$$\text{Therefore probability of ruin} = \int_{1.6}^\infty dF(x)$$

$$= \int_{1.6}^\infty e^{-x}dx$$

$$= 0.2019$$

From the above one can conclude that the utility, expected profit and probability of ruin are all affected by the value of κ. If we assume the company accepts a ruin probability of ≤ 0.27, then it will only consider the arrangements number 7-12, from which the company chooses the one with the highest utility, namely the arrangement number 10 which gives utility equal to 0.240, at $\kappa = 0.86$.

Table 10.1

Quota Share Reinsurance Arrangement

No.	κ	Utility	Expected profit	Probability of Ruin
1	0	0	0.20	0.3012
2	0.1	0.056	0.19	0.2982
3	0.2	0.101	0.18	0.2923
4	0.3	0.142	0.17	0.2865
5	0.4	0.174	0.16	0.2808
6	0.5	0.195	0.15	0.2725
7	0.6	0.216	0.14	0.2645
8	0.7	0.230	0.13	0.2393
9	0.8	0.237	0.12	0.2019
10	0.86	0.240	0.115	0.1791
11	0.9	0.238	0.11	0.1225
12	1.0	0.231	0.10	0

Source: Borch, 1974, p 94.

The final point in the activity of an insurance company is concerned with investment decisions. Investment funds are of two kinds: (i) technical reserves funds, and (ii) shareholders funds. Practice shows that the first is more significant than the second in terms of its volume. The objective of the company's management, from the investment point of view, is to discover the actions which

provide the best attainable return. This means that the management should have the ability to differentiate between various alternatives over its investment policy, and then choose the most favourable alternative with which to obtain the highest return.

One of the most difficult financial decisions facing the insurance company is the determination of the liquidity of its funds since, normally, (i) interest rates are inversely related to liquidity, and (ii) expected rates of return on different types of investment are directly related to their riskiness. The optimal investment, however, relies on two factors: firstly, the claims distribution. Since the reinsurance arrangement has its effect on the claim distribution, the investment and reinsurance decisions should be analysed together. Secondly the available investment opportunities, and the decision which has to be taken by the company, have a substantial effect on the rate of return on the company's invested funds.

One can conclude from the above, that there is a close relationship between the three activities of production, reinsurance, and investment. Taking into account that the correlation exists between these activities, a company's ultimate objective should be to find decisions which are jointly optimal.

10.3 The Corporate Objectives of Arab Insurance Companies

Having discussed corporate objectives and retention limits in general terms, attention will now be focussed on the practices of Arab insurance companies.

A questionnaire was sent to 143 insurance and reinsurance companies in the Arab World (see Appendix) and replies were received from 46, i.e. almost one-third. The replies represented 15 of the 21 countries to which the questionnaires were sent, and covered the types of companies shown in Table 10.2.

Table 10.2

Types of Ownership and Number of Respondents

Type of Ownership	Number of Respondents	%
State	9	20
Private	14	30
Mixed	6	13
Co-operatives	2	5
Foreign Subsidiary	1	2
Owned by local interest and foreign company	14	30
Total	46	100

In response to the question as to how long had they been established, only one-third said they were more than 20 years old and almost a half had been formed within the last ten years (see Table 10.3).

Companies were also asked whether they have formal/explicit corporate objectives. 83% of the respondents replied in the affirmative (see Table 10.4).

Question four asked the respondents to specify from a list of nine commonly cited corporate objectives and any other which they wished to add, their primary objectives, ranking them in order of importance. Some respondents cited only one, others ranked several. Table 10.5 and figure 10.1 which were constructed from

Table 10.3

Companies' Dates of Establishment

Type of Ownership	0-5 yrs. No.	%	6-10 yrs. No.	%	10-20 yrs. No.	%	20-30 yrs. No.	%	Over 30 yrs No.	%	Total No.	%
State	-	-	1	11	3	33.5	2	22	3	33.5	9	20
Private	2	14	6	43	3	22	2	14	1	7	14	30
Mixed	2	33.3	2	33.3	-	-	2	33.3	-	-	6	13
Co-operative	-	-	-	-	1	50	-	-	1	50	2	5
Foreign Subsidiary	-	-	-	-	-	-	-	-	1	100	1	2
Owned by local interests & foreign co.	1	7	7	50	3	21.5	3	21.5	-	-	14	30
Total	5	11	16	35	10	22	9	19	6	13	46	100

the replies, show that, with the exception of the subsidiaries of foreign companies, the three most important objectives (ranked in order of importance) were:

1. to provide a service for insured clients at a fair price;
2. to maintain the financial strength of the company;
3. to achieve a satisfactory level of profit.

It can thus be observed that companies in the Arab World tend to be orientated towards social objectives, i.e. providing a service for insured clients at a fair price, rather than profit objectives. This is to be expected because firstly, from the outset, for State insurance companies that has been a principal objective laid down for them by their governments. Secondly, for other companies (except foreign subsidiaries), it may be because it is essential for their business future to show that they are more concerned with furnishing a good service for their policyholders than to achieve profit.

Table 10.4

The Position Regarding Corporate Objectives

Type of Ownership	Yes		No	
	No.	%	No.	%
State	8	89	1	11
Private	11	79	3	21
Mixed	4	67	2	33
Co-operative	2	100	-	-
Foreign Subsidiary	1	100	-	-
Owned by local interests & foreign company	12	86	2	14
Total	38	83	8	17

The average rankings given to the two profit objectives included in the list (i.e. 'to maximise profits for the coming year', and

Table 10.5

Prime Objectives of Insurance and Reinsurance in the Arab World[1]

Objectives	State		Private		Mixed		Co-operatives		Foreign sub.		Local & Foreign		Total	
	total points	degree of importance	total points	degree of importance	total points	degree of importance	total points	degree of importance	total points	degree of importance	total points	degree of importance	total points	degree of importance
(a) Service	71	1	123	1	53	1	18	1	7	3	103	1	375	1
(b) Financial Strength	53	2	101	2	50	2	17	2	9	1	96	2	326	2
(c) Maximise profit 1 yr	32	5	70	8	20	9	14	3	8	2	59	5	203	7
(d) Maximise profit 5 yr	26	6	75	6	21	8	14	3	6	4	54	7	195	8
(e) Dividends growth	1	8	72	7	26	7	11	4	1	9	52	8	163	9
(f) Satisfactory profit	53	2	92	3	42	3	14	3	5	5	66	3	272	3
(g) Premium growth	45	4	86	4	31	4	4	6	4	6	56	6	226	5
(h) Retained premium	50	3	84	5	28	6	11	4	3	7	66	3	242	4
(i) Market Share	32	5	72	7	29	5	9	5	2	8	62	4	206	6

[1] The method of calculating the total points for the purpose of determining the importance of the factors was as follows:

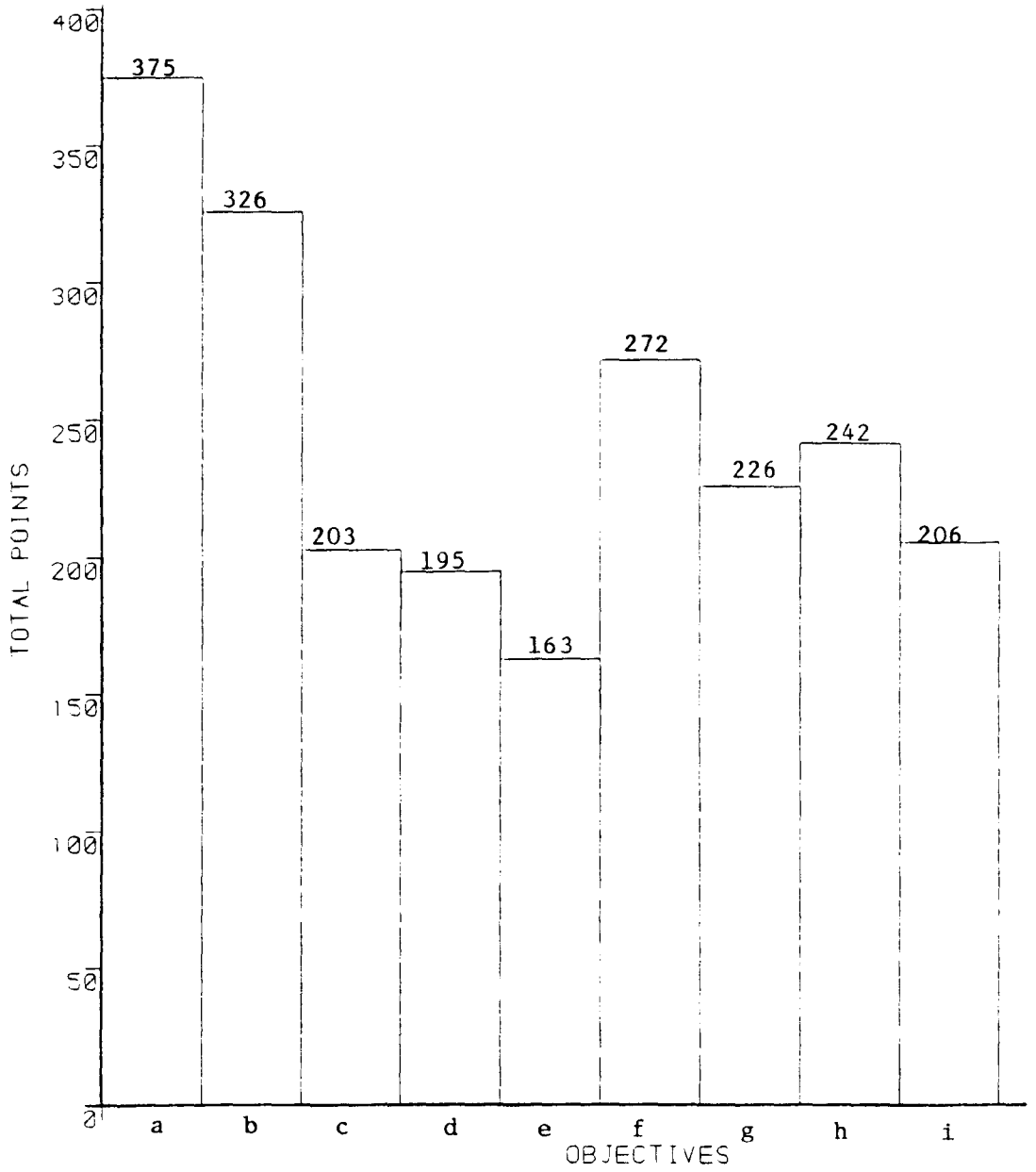
First points were awarded to each factor according to the ranking given by the respondent, i.e.

first	9 points
second	8 points
↓	↓
ninth	1 point

Then the points awarded on the basis of each respondents ranking were added to produce the total points.

Figure 10.1

Prime Objectives of Companies
in the Arab World



to maximise profits over five years') differ by type of company. State companies considered them to be of the fifth and sixth degree of importance respectively, private companies of the eighth and sixth, and mixed companies of the ninth and eighth. Co-operatives ranked both of the objectives in third place, foreign subsidiaries in the second and fourth, and companies owned by local and foreign interests in the fifth and seventh.

These findings are in marked contrast to the results of a survey conducted by an Advanced Study Group of the Insurance Institute of London (1982) which indicated that profit was the primary motive of the majority of U.K. insurance companies, apart from specialist life offices (see Table 10.6). According to Sharp (1983, p 85), Australian companies are even more profit-orientated (see Table 10.7).

Table 10.6

The Prime Objectives of the United Kingdom Companies

Objectives	Insurance Companies									
	Life		General		Composite		Brokers		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
To achieve a profit target	20	43	26	90	14	61	7	78	67	63
To achieve a production target	23	50	12	41	11	48	3	33	49	46
To determine probable future profits	21	46	18	62	13	57	5	56	57	53
To determine future production patterns	15	33	14	48	11	48	3	33	43	40
Other	11	24	6	21	5	22	3	33	25	23

Source: I.I.L., (1982 p 45).

In addition to the objectives listed in the questionnaire, 25 companies said that they had other objectives which may be classified as follows:

1. To promote private inter-Arab investment.

2. To maximise profits as well as protect the environment in which the company operates.

3. To achieve better co-operation between local insurers in order that they should share risks rather than compete to accept high liabilities at low premiums.

4. To achieve a production target.

5. To find a way to develop real co-operation between our sister countries and increase our market share.

6. To satisfy our clients while maintaining, or even increasing, our rate of growth.

The answers to the last three questions of the questionnaire, which sought information about how the companies fix their retention limits, will be considered in Chapter 12. Meanwhile the remainder of this chapter will be devoted to a more detailed examination of the inter-relationships between retention limits and some of the corporate objectives of insurance companies, commencing with profit.

Table 10.7

The Prime Objectives of the U.K. and Australia Companies

Objectives	Australia	U.K.
To achieve a profit target	93%	63%
To determine future profits	60	53
To achieve production target	49	46
To determine future production patterns	34	40

Source: Sharp (1983 p. 85).

10.4 Profit Target

Although Arab companies, unlike their British and Australian counterparts, may not place profit high on their lists of corporate objectives, it does appear amongst them. The questionnaire referred to the maximisation of profits, the realism of which has been questioned earlier in this chapter, so now the matter will be examined in more detail, together with the relationship between profit objectives and retention limits. First the sources of an insurer's profits will be explained.

10.4.1. Sources of Profit in Insurance and Reinsurance Business

The net earnings of insurance and reinsurance companies are obtained from:

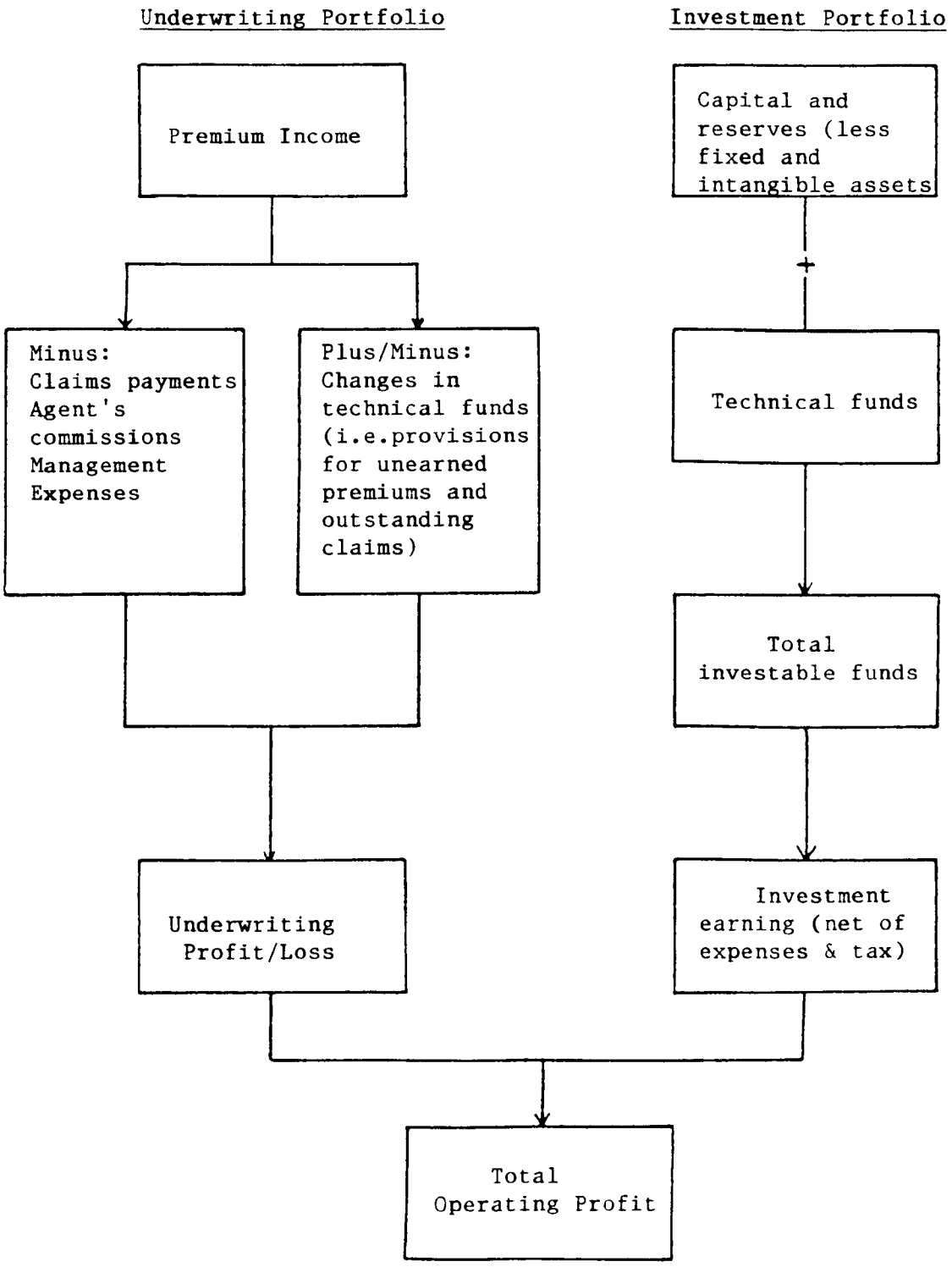
(i) the difference between the premiums they receive and the claims and expenses incurred (the underwriting result); plus

(ii) the earnings they receive from the investment of their funds, which consist of their capital and free reserves plus funds they accrue from their underwriting activities representing liabilities to policyholders (the technical reserves).

Figure 10.2 shows the two sources of profit in diagrammatic form. Traditionally non-life insurers and reinsurers have treated underwriting profit as the appropriate measure of the profitability of their business. Today there is far greater acceptance of the

Figure 10.2

Sources of Profits in the Insurance Industry



concept that one should also bring into account the investment earnings on the technical funds. For example, Meinertzhagen (1983, p 4) chairman of the Royal Insurance Co., writes:

> "Insurance Companies, however, hold-out of premiums received funds to provide for unearned premiums and outstanding claims, which are invested and on which investment income is earned. The investment of these funds and the earnings on them are an integral part of the insurance operation. We felt it right to give shareholders a clearer understanding of the return derived from our insurance operations by changing the format of the Revenue Account to include an item for the investment income earned on these funds".

An insurer's profit performance is closely tied up with both the general economic cycles and market conditions. Accordingly, underwriting profit in many classes of insurance tends to be cyclical. Table 10.8 and Figure 10.3 show the underwriting results of total non-life business for nine developed countries for the period 1973-1980. Underwriting losses predominated in the majority of countries and years. Compared with those countries, the underwriting results of Arab insurance markets (which are recorded in Chapter Three) have been relatively good. However, even in profitable markets some insurance companies may incur losses due to poor underwriting and/or claims control and/or general management.

An insurer's investment earnings are also to some degree beyond its control being dependent on market interest rates, etc. But they also depend on the size of the funds at its disposal, the length of time for which the funds are available for investment,

Table 10.8

Underwriting Results of Total Non-Life Business as Percentage of Premiums for the Period 1973-1980

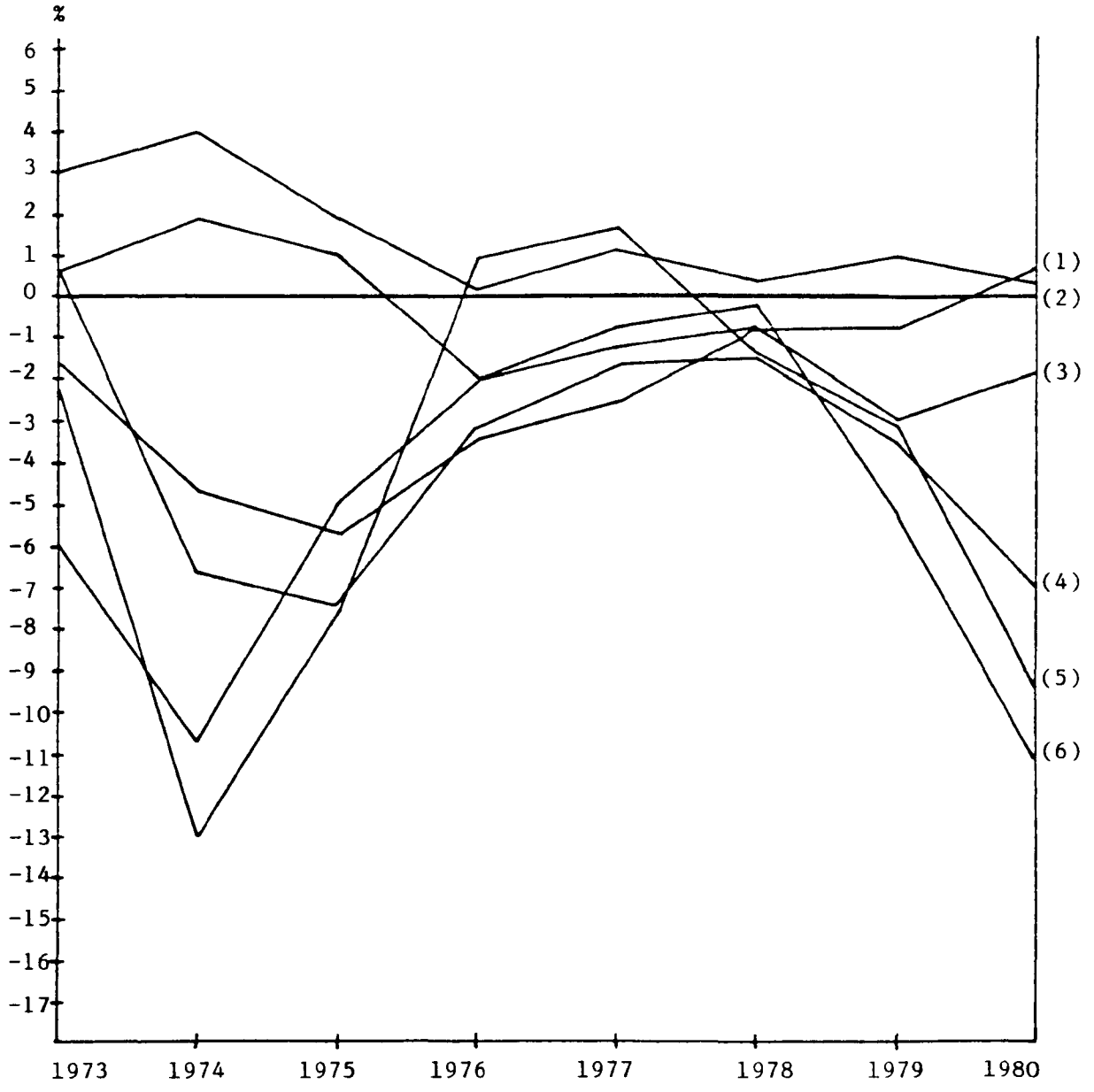
Country	1973 %	1974 %	1975 %	1976 %	1977 %	1978 %	1979 %	1980 %	Average
Australia (1)	-2.3	-13.0	-7.8	+1.0	+1.6	-1.4	-3.1	-9.4	-3.1
Canada (1)	-6.1	-10.6	-4.9	-2.0	-0.7	-0.2	-5.2	-11.0	-5.1
W.Germany (1) (4)	+3.1	+3.9	+1.8	+0.2	+1.1	+0.4	+1.0	+0.3	+1.4
G. Britain: domestic B(1) (3)	+0.6	+1.8	+1.0	-1.9	-1.2	-0.7	-2.8	-1.7	-0.6
foreign B(1) (3)		-6.6	-7.5	-3.2	-0.6	-0.4	-3.4	-6.9	-4.1
Japan (1)	-1.7	-4.7	-5.7	-3.4	-2.5	-0.6	-0.7	+0.6	-2.3
Netherlands (1)	+5.1	-0.4	-3.2	-4.9	-5.0	-2.5	-0.6	+1.4	-1.3
Spain (2)	-9.7	-7.9	-5.7	-9.8	-13.8	-15.9	-17.2	-14.9	-11.9
Switzerland (1)	-1.8	+2.8	-6.0	-6.6	-6.8	-6.6	-6.4	-7.7	-4.9
United States (1)	+0.8	-5.6	-8.4	-3.4	+1.6	+2.4	-0.4	-3.0	-2.2

Source: Extracted for Sigma-Swiss Re, No. 9/1979 for the year 1973, No. 9/1980 for the year 1974, No. 9/1981 for the years 1975-1979, and No. 9/1982 for the year 1980.

(1) Total business for own account.
(2) Gross direct business.
(3) Excl. marine and aviation.

Figure 10.3

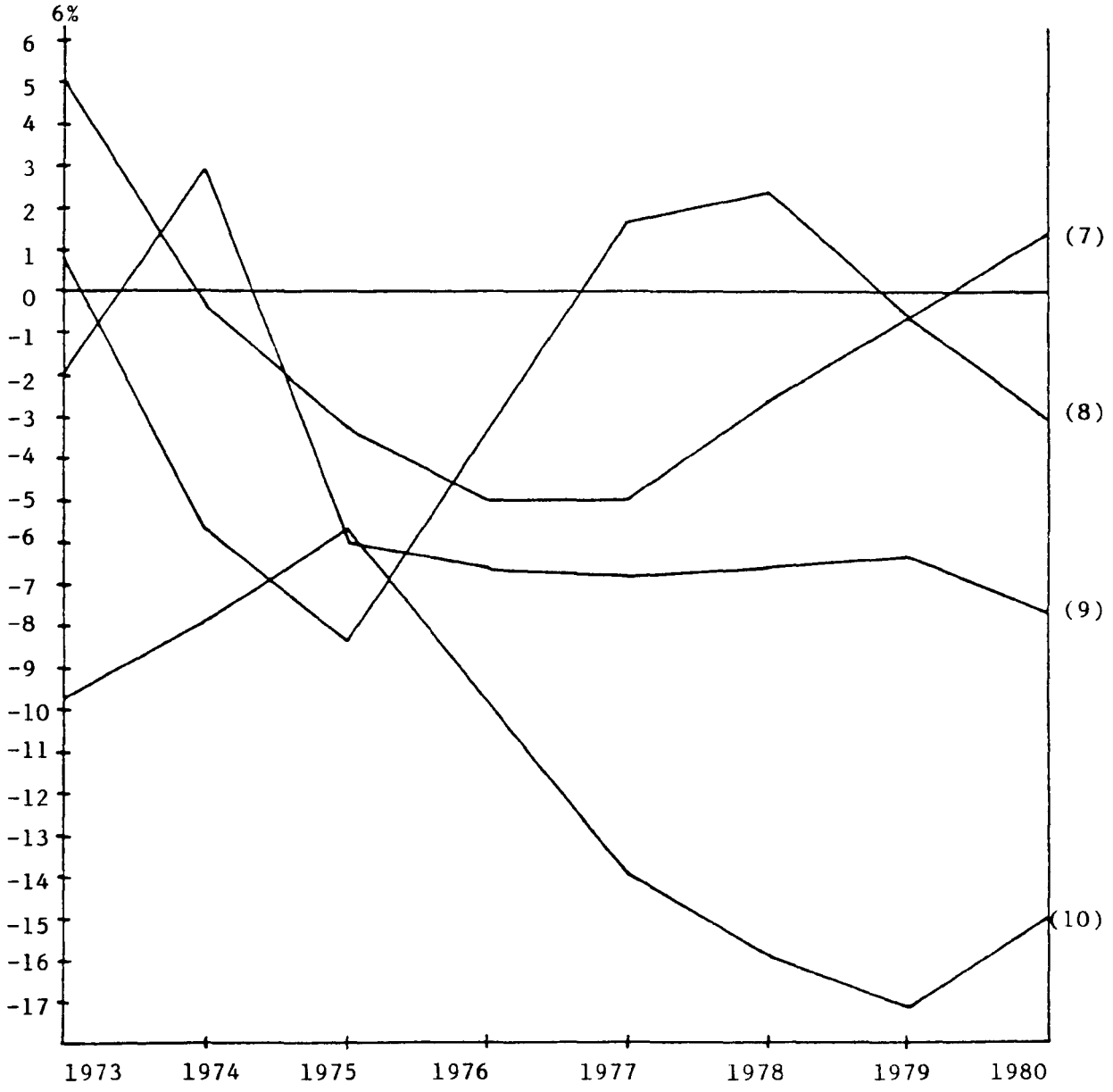
Underwriting Results as Percentage of Premiums in Total Non-Life Business



Source: Table 3.

(1) W. Germany
(2) Japan
(3) Great Britain (Domestic)
(4) Great Britain (Foreign)
(5) Australia
(6) Canada

Figure 10.3
continued



(7) Netherlands
(8) United States
(9) Switzerland
(10) Spain

and the investment policy pursued. Although a company's investment income invariably will be positive and usually sufficiently large to cover any underwriting loss, in volatile capital markets realised and unrealised capital losses due to falling stock market prices may easily exceed the investment income.

10.4.2 Constraints on Insurance Profitabiity

An insurer's profitability and consequently its retention limits may be constrained in various ways, namely:

1. The actual profit may vary from expected profit, not least because of random fluctuation in claims experience. The higher are the potential fluctuations from year to year in the number and/or size of losses, the more may actual profit vary from the expected profit.
2. Government regulation may adversely affect both actual and expected profit. Mehr and Hedges (1974, pp 174-5) indicate three kinds of regulations that may curtail an insurer's profitability, that is regulations on: (i) premium rates, (ii) capital requirements, and (iii) types of investment. For example, in many countries investment regulations prevent insurers from investing their funds in certain types of assets, or stipulate how funds shall be invested, or place limits on the amount that can be invested in any security or type of security.
3. Inflation has adversely affected profits and made the estimation of outstanding claims more difficult, so that apparently good underwriting result may badly deteriorate as outstanding claims are settled for amounts in excess of the figure originally reserved. The longer

a claim remains outstanding the greater it is exposed to the effect of inflation. Table 10. 9 illustrates how the settlement cost of a claim valued at $3000 at the date of occurrence would increase as the time to settlement lengthens, assuming constant annual rates of inflation as shown in column 1.

4. Technological progress, which affects the nature of insurable risks, adds a further element of uncertainty to rating and consequently to profit. Whatever the underwriters' skills are, they can never be adequate enough to keep pace with the technological change, especially in the field of microtechnology.

5. Finally there is the impact of competition on premium rating levels. One of the greatest problems of the insurance industry is increasing competition which forces down prices to uneconomic levels leading to substantial underwriting losses. In many countries pricing competition has caused the failure of many insurance companies.

Consequently instead of seeking to maximise profits, insurers may be content to set profit targets in terms of satisfactory profits. In either case, given the unavoidable fluctuations in gross claims costs and investment yields from year to year, any form of profit target is more likely to be framed in terms of expected rather than actual profits, subject to a tolerable degree of variation in the actual from the expected profit.

10.4.3 Profitability and Retention Limits

A relatively large retention usually indicates that an insurer

is convinced of good expected profit for the business he has written, and vice versa. In such cases, the insurers frequently wish to carry no more than a minimum retention. This would have a direct effect on the insurer's retained premium income.

Table 10.9

Effect of Inflation on Claims Settlement

Annual rate of claim inflation	Estimated claims cost at date of occurrence	Cost of Claims Settlement		
		After 4 years	After 8 years	After 12 years
	$	$	$	$
6%	3000	3787	4782	6037
9%	3000	4235	5978	8438
12%	3000	4721	7428	11688
15%	3000	5247	9177	16051
18%	3000	5816	11277	21863

However, in making any decision on the determination of retention limits, one must take into consideration: (a) absolute expected profits and probable expected profits relative to retained premium income, and (b) the variability of retained claims costs, and therefore of profits, relative to retained premium income. Assume, for example, that an Arab insurer would like to fix a higher retention limit for his reinsurance treaties in order to achieve a larger retained premium income and thereby increase his absolute underwriting profits. Though a higher retention limit would increase retained premium income, it would also expose the insurer to the risk of greater variability in results. An adverse claims fluctuation may result in an increase in retained claims costs larger than the additional retained premium income, thereby reducing

absolute profits and diminishing the amount which otherwise could have been available for strengthening the insurer's financial position.

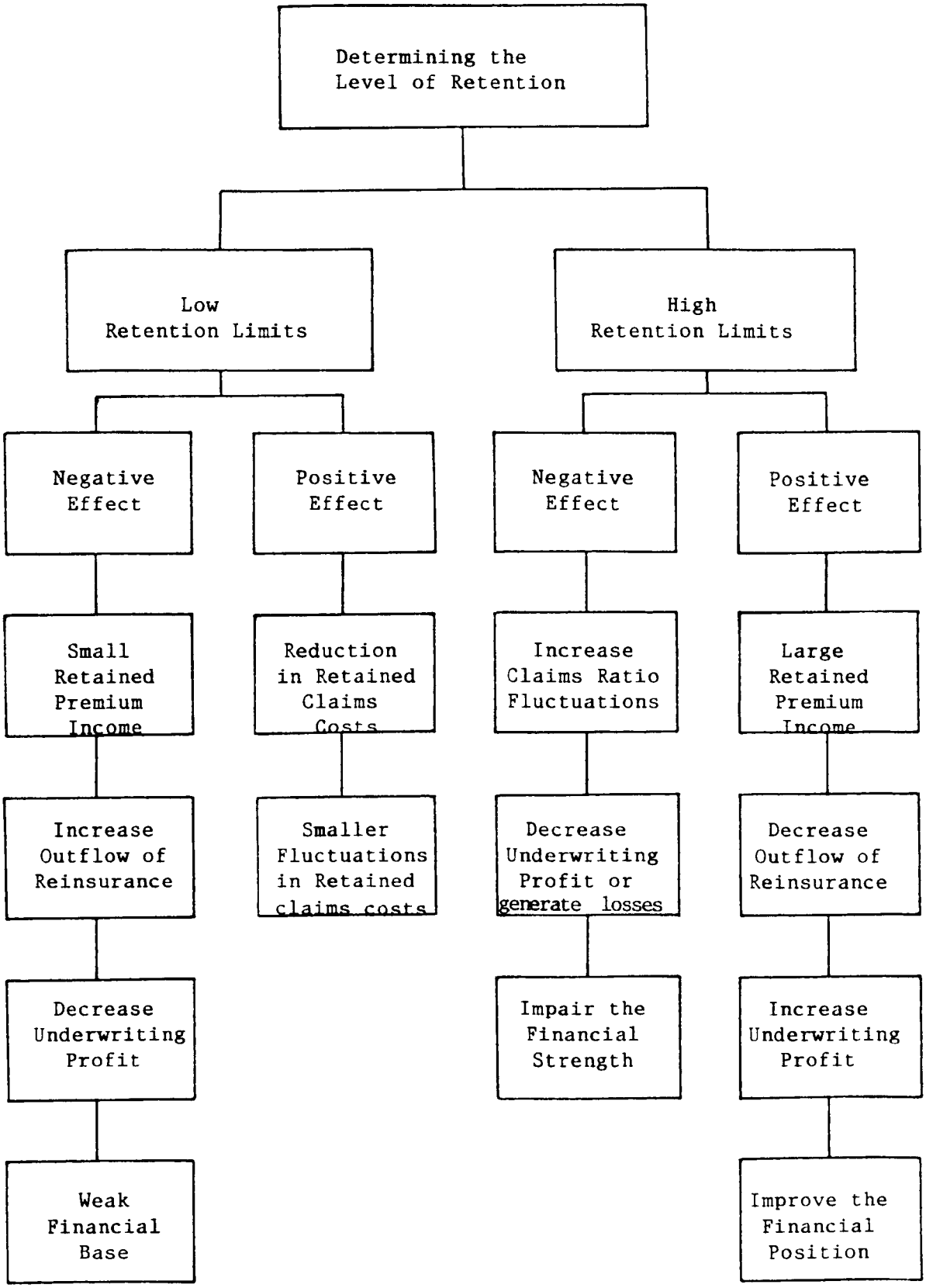
A reduction in the insurer's current retention limit(s) would have the opposite effects. Although it would have the benefit of reducing the variability of retained claims costs it would be at the expense of a fall in both the company's retained premium and, as noted in section 10.2.4, its expected profit. Such potentially positive and negative effects of changing retention limits are illustrated in figure 10.4.

Thus, if a company's management feels unsure about its ability to fix retention limits correctly in order to achieve the desired balance between the various corporate objectives, it may prefer to err on the side of caution, and accept a lower absolute expected profit. As demonstrated already, an insurer's retention limits, retained premium income, financial base and expected profit are all inter-related.

A final complication in estimating the impact of changing retention limits on expected profit is the effect of an insurance company's reinsurance arrangements on its investment earnings. Not only, as explained in Chapter 9, do the latter affect the level of liquidity which an insurer needs to maintain, it also affects its cash flow and the size of the funds available for investment. And in the case of proportional reinsurance treaties, if the ceding company is allowed to retain premium and loss reserves, allowance must be made for the differences between the rate of interest payable to the reinsurer on those reserves, and the yield which

Figure 10.4

Effect of Determination Retention Limits



the ceding company can obtain on its invested funds.

So it is that there is a trade-off between risk (i.e. retained claims variability) and profit, and the insurer will need to select that reinsurance programme which yields him greatest utility. In considering various alternative programmes it seems that the retention limits have to be projected back on the profit objective. The shorter the time period taken for the measurement of profit (e.g. one year as against, say, five years) the relatively larger will be potential variation in the outcome.

10.5 Production Target

Ansoff (1968, p 98) has pointed out that there are only three methods in which any business can grow, namely market expansion, product expansion and diversification. So an insurance company can increase its gross premium income through:

1. Expansion of existing product lines (e.g. selling its present products to new customers).
2. Expansion into new products (e.g. selling new products to its existing customers).
3. Diversification into other customers and types of business (e.g. selling new products to new customers). These ways can be illustrated in Table 10.10.

In the insurance industry, market penetration is typified by providing an ongoing service to the existing insureds, reviewing their cover and revising their sums insured according to rises in the subject matter value. This strategy has long been practised

Table 10.10

Methods of Business Growth

Product / Market	Present	New
Present	Market Penetration	Product Expansion
New	Market Expansion	Diversification

Source: Ansoff (1965-8, p 99).

by many insurance companies world-wide and it is one of the most reliable sources of new premium income (Churchill, 1972 p 147).

New products and markets are important for three reasons: (i) to increase gross premium income and the overall profitability of the company; (ii) to assure sustained growth; and (iii) to diversify portfolio business and reduce the variability of claims costs (and so profits). The expansion of existing products is also an important strategy for increasing gross premium income. This strategy may be achieved by a company selling its existing product(s) to new customers. Business expansion through the development of new products may derive from two kinds of pressure; that is:

(i) the pressure to supply new products in response to the demands of policyholders and/or agents. For example, a policyholder may ask for business interruption insurance in addition to his existing fire policy, or for a liability insurance to be extended to cover pollution liability.

(ii) the pressure to react to such developments by competitors.

Regardless of the manner in which business expansion occurs, it will both lead to the growth of gross premium income and directly affect the company's retained premium income too.

Having established the methods for increasing the volume of business transacted, a company needs to decide upon its marketing strategy. The focus may be on present or new customers, or both. How can they be influenced? What is the company's selling strategy? Can the company increase its sales volume? etc. The answers to these questions lead to an understanding of the effectiveness of the company's marketing policy. Figure 10.5 shows the process of premium income growth discussed above.

Obviously there is a direct relationship between the growth of sales and a company's market share. Therefore the relationships between business growth or market share objectives and insurers' retention limits will be examined together.

10.6 Determination of Market Share

Market share can be defined as the ratio of an insurer's gross premium income to the total written premiums of the industry. The simplest mathematical formula of market share is:

$$M = \frac{GP_f}{GP_I} \times 100$$

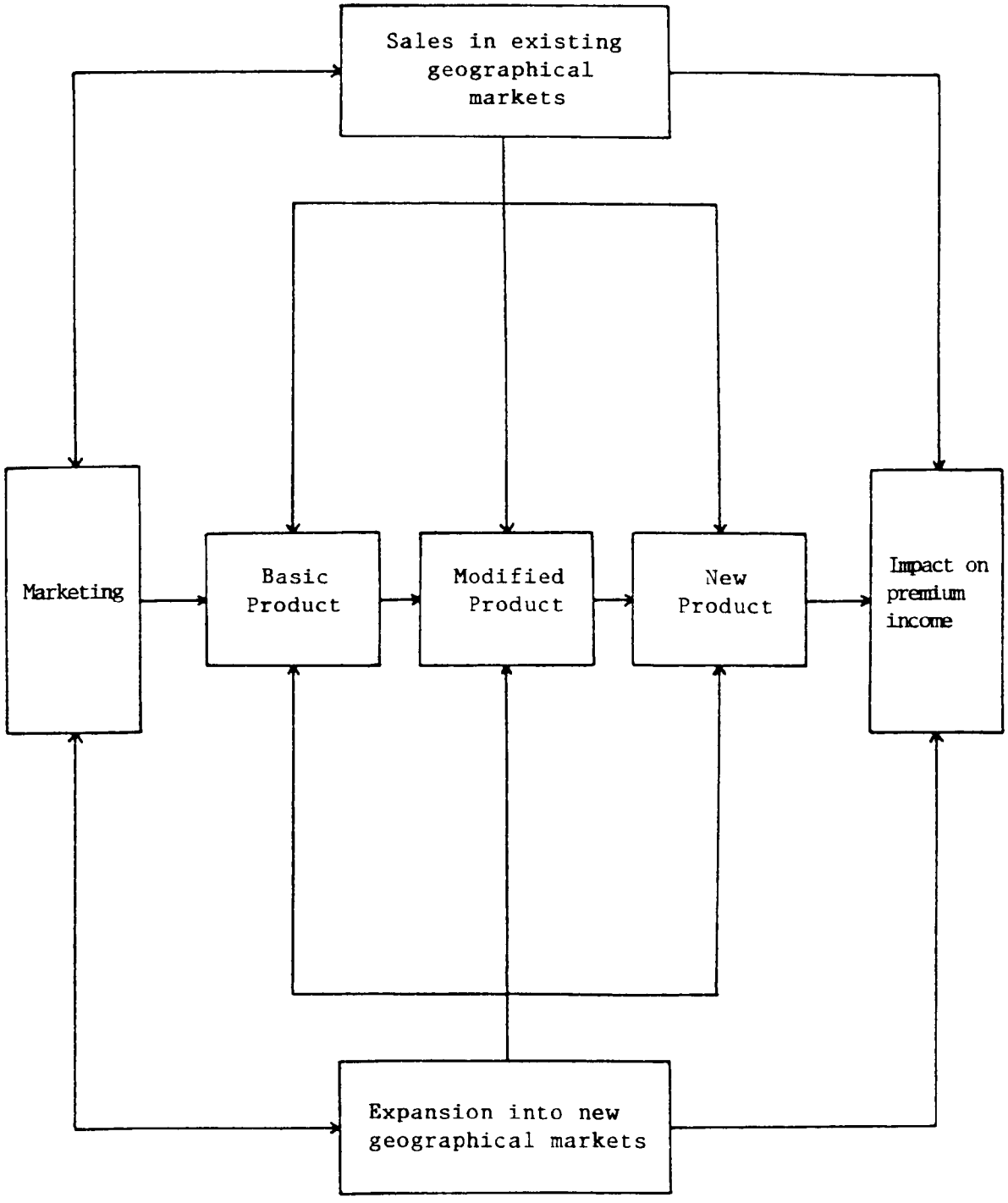
where M = Market share of the firm, expressed as a percentage

GP_f = Gross written premiums of the firm

GP_I = Gross written premiums of the entire insurance industry

Figure 10.5

Growth of Premium Income Process in an Insurance Company



There are various reasons why an insurance company may seek to increase its market share, such as managerial prestige, to improve its position relative to other companies to increase its retained premium income and/or profit, or to achieve and maintain a leadership position in a chosen field. On the other hand, a company may sometimes prefer to reduce its market share if the market as a whole is experiencing substantial losses.

An insurance company should be interested in measuring its market share in order at least to provide a comparison of its sales performance with the average performance of other companies in the market (Kotler, 1976, p 452). Market share, however, reacts substantially to competitive forces which may cancel out any attempt by a company to increase the market share.

Business Growth/Market Share and Retention Limits

All other things being equal, any rise in an insurance company's gross premium income normally will produce:

(i) increases (though not necessarily proportionate increases) in both its retained premium income, and the premiums ceded to its reinsurers; and

(ii) a decrease in its solvency margin.

It may also be associated with a deterioration in the profitability of its business due to an increase in:

either its variable costs relative to premium income, perhaps because of the payment of higher commission rates to attract more business from agents and brokers, or other additional

marketing expenditure;

or its claims and expense ratios due to it competitively cutting premium rates;

or its claims ratio due to a lowering of its underwriting standards.

A worsening of its claims experience eventually would lead to a deterioration in the terms which it could obtain from its reinsurers.

Therefore, before adopting any particular business growth/market share objective the management of a company must consider the implications for its reinsurance programme, including its retention limits. How the growth of gross premium income may affect the latter depends on a number of factors which were discussed in Chapter 9.

The response of a company's management to any reduction in the contingency and profit loadings of premium rates should be to examine the need to reduce its retention limits. At the same time, however, consideration must be given to a possible increase in the cost of reinsurance attributable to any deterioration in the company's claims experience.

The effect of business growth on the company's capital resources relative to its potential claims liabilities, and on the variability of claims costs are other factors to be considered. If a company's solvency margin is well above the statutory minimum, or it can raise additional capital, so that its solvency margin does not act as a constraint on the growth of retained premium income, it could enable the company to increase its retention limits. Moreover, if the growth of a company's business reduces the relative fluctations in its aggregate claims costs, and does not lead to a rise in its

claims ratios, it may have other beneficial effects. It could improve the balance between the premium income and potential claims liabilities of its reinsurance treaties, which may enable it to negotiate better terms with its reinsurers. Also it may enable the company to switch from proportional to non-proportional reinsurances, thereby further increasing its retained premium income.

10.7 Strengthening the Solvency Margin

Benjamin (1977, p 268) defines solvency as follows:

"A company is solvent if its assets exceed its liabilities with a certain probability".

In other words, the company is in a position not only to meet its liabilities, including expected claims, but has a margin of assets to cover possible adverse fluctuations in aggregate claims costs. It would be unrealistic for a company to maintain a margin of assets over liabilities to meet any conceivable eventuality,[1] but the margin should be such as to reduce the probability of ruin to an acceptable level in order to provide policyholders with the security they expect when buying insurance.

Pentikainen (1967), p 4) has listed four means of protecting solvency:

1. Sufficient premium rates.
2. Reinsurance.

---

[1] "It cannot define solvency in a way that gives any certainty that an insurer can meet his obligations. Catastrophes are conceivable that could exhaust the assets of even the soundest insurer, even in the absence of a catastophe, an insurer can sustain a long run of bad experiences that can eventually cause insolvency." (Kimball, 1969, p 147).

3. Adequate solvency margin.

4. The continuous internal and external inspection of a company's accounts and operations.

As already explained, 1 to 3 are inter-related, and the regular monitoring of a company's operations should be standard practice.

Ideas both as to what constitutes an acceptable probability of ruin, and how to measure solvency, differ. Therefore, solvency regulations and minimum solvency margins also vary between countries. The U.K., for example, has adopted the common European Community regulations and the Insurance Companies Act, 1982, requires companies transacting general insurance business to maintain a minimum solvency margin equal to the largest of the amounts produced by two formulas, known as: (1) the premium basis, and (2) the claims basis. By using the first method, the solvency margins are calculated on the gross premium income receivable by the company in the preceding year. The minimum solvency margin is 18 per cent on the first 10 m. ECUs,[1] and 16 per cent on the balance. As regards the claims basis method, the solvency margins are calculated on one third of the aggregate gross claims paid during the last three preceding years. According to this method companies must maintain a minimum solvency margin equal to 26 per cent on the first 7m. ECUs, and 23 per cent on the remaining excess, (see tables 10.11 and 10.12). The figures (1) and (2), mentioned in these tables, are modified by the total claims recoverable on reinsurances ceded, subject to a maximum adjustment of 50 per cent.

---

[1] ECU means the European Currency Unit which the companies should convert their accounts into.

Table 10.11

Determination of Solvency Margin on the Premium Basis

Gross premium income	Solvency margin
(1) The first 10 million ECUs	18 per cent
(2) Over 10 million ECUs	16 per cent

Source: Insurance Companies Act 1982.

Note: The above percentages are reduced to 6% and 5½% respectively in case of health insurance based on actuarial principles.

Table 10.12

Determination of Solvency Margin on the Claims Basis

Gross claims paid	Solvency margin
(1) The first 7 million ECUs	26 per cent
(2) Over 7 million ECUs	23 per cent

Source: As for Table 10.13.

Note: For the same class of business in the above note (Table 10.11) the above percentages are reduced to $8^{2}/_{3}$% and $7^{2}/_{3}$ %.

In the United States there is no statutory solvency margin per se. According to Pentikainen (1982, p 1.5-7), in the USA, the premium/surplus ratio is used as a general measure of companies' solvency. If this indicator is less than 2, the financial position of the company is good, if it exceeds 3, the situation is deemed alarming.

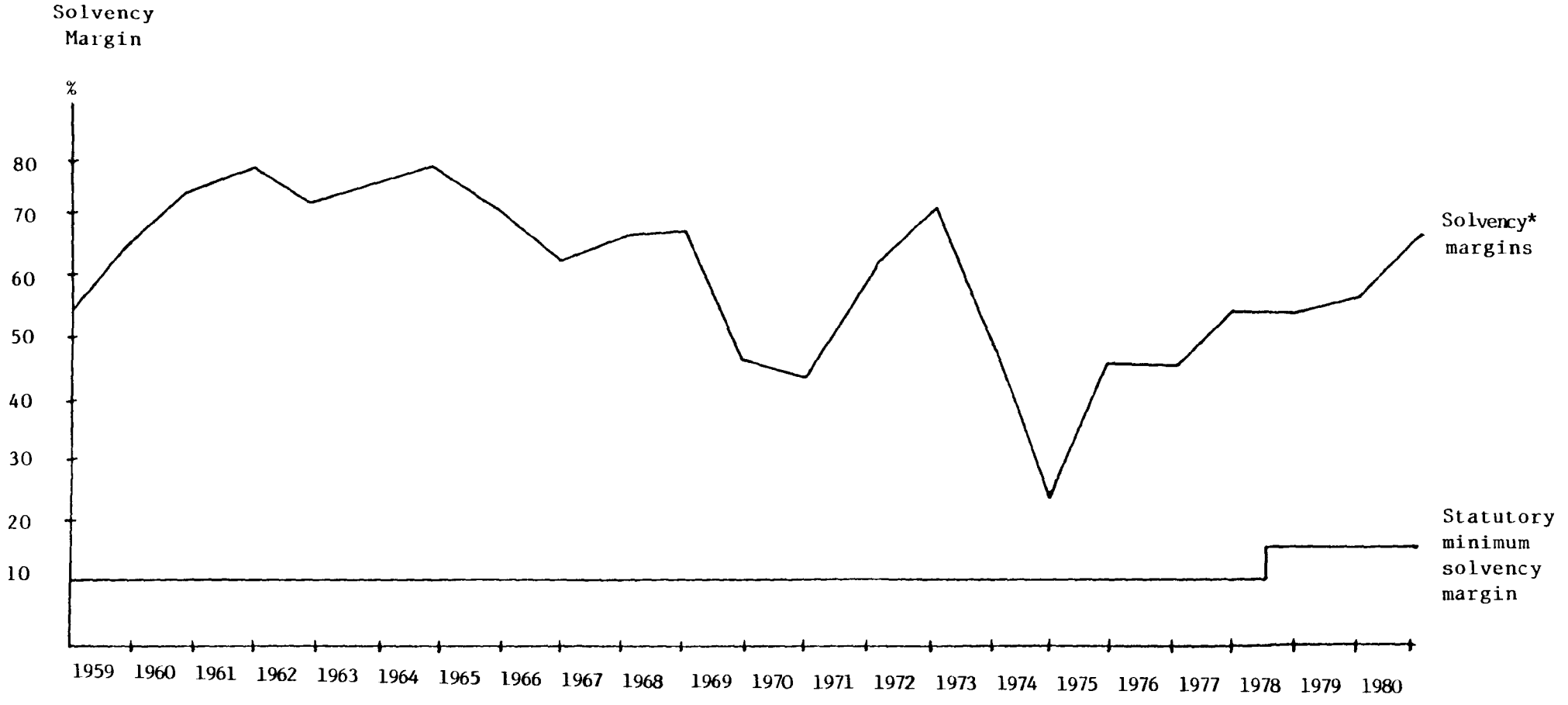
In Egypt, companies transacting non-life business are required to maintain a minimum 10 per cent solvency margin (Crowe, 1982, p 196) and minimum capital requirements are imposed in most of the other Arab countries. Supervisory authorities in other developed and developing countries follow the same pattern. They either require companies to maintain a prescribed minimum solvency margin and/or stipulate other capital requirements, such as the minimum paid-up share capital and possibly the deposit of assets. Most companies endeavour to maintain solvency margins well above the statutory minimum, and so actual solvency margins both tend to vary over time (as shown by figure 10.6) and between companies (see also Table 10.13). Dickinson and Roberts concluded from their study that firstly, the major UK companies aim to maintain solvency margins well above the minimum required by the law, and secondly, that those margins have been subject to large fluctuations, mainly due to:

1. changes in the market values of assets;
2. fluctuations in retained profits;
3. movements in foreign exchange rates; and
4. high growth rates of premium income.

Table 10.13 provides a comparison of the solvency margins of British, Egyptian and Iraqi insurance companies. The average solvency margins of the two Iraqi companies (National Inc. Co. and Iraq Re.) were, generally, a little above those of the leading British insurers. However, the solvency margin of the National Insurance Company of Iraq did fall substantially from 117.5 per cent to 42.2 per cent in 1980, its retained premium income having

Figure 10.6

Average Solvency Margins of Seven Largest U.K. Non-Life Insurance Compaines
(Inc. Insurance Companies Acquired Since 1959).



Source: Dickinson and Roberts (1982, p.17).

* Assets at market or estimated market values.

Table 10.13

Solvency Margins of British, Egyptian and Iraqi Insurance Companies at Year End

	1971 %	1972 %	1973 %	1974 %	1975 %	1976 %	1977 %	1978 %	1979 %	1980 %
Average of ten leading British Companies	40.5	43.2	38.2	30.9	34.9	30.7	36.8	40.0	41.7	43.0
Royal Insurance Company	na	37.8	35.8	30.5	34.9	27.3	28.7	33.8	45.3	36.8
Norwich Union	na	20.2	20.6	40.4	43.5	57.9	90.6	103.2	79.5	87.2
Average of four Egyptian Companies (including Egypt Re)	na	na	na	na	33.8	32.4	29.8	18.4	15.1	17.4[N]
Egypt Reinsurance Company	16.0	12.4	18.3	14.5	11.4	10.6	10.2	8.3	5.6	4.4
Average of two Iraqi Companies (National Ins. Co and Iraq Re)	62.8	57.8	54.2	43.1	29.7	32.0	35.7	42.1	34.4	32.7
National Insurance Company	117.5	104.1	98.9	63.7	45.3	49.4	58.5	61.2	51.1	42.2

Source: (1) Carter 1972-1981 for British Companies
(2) The Egyptian Re., Annual Report for 1981/82, p 30. Its solvency margin has been measured as the ratio of paid-up capital plus free reserves to net premium income.
(3) EGIO (1975-1980)
(4) National Insurance Co., Annual Reports for 1971-1980.
(5) Iraq Re., Annual Reports for 1971-1980.
N = figure for 1980/81.

grown at a faster rate than its capital and free reserves. Figure 10.7 graphs the change in the solvency margins of the Iraqicompanies over the ten years 1971-1980.

The average solvency margins of the Egyptian companies, which are shown in figure 10.8, fell well below those of the British companies after 1976.(1) The position of the Egyptian Reinsurance Company looks very unhealthy. On the basis of the information given in its published accounts, by 1978 its solvency margin (as defined in footnote 2 of Table 10.13) had fallen below the statutory minimum. Possibly the company had hidden reserves and it does have the ultimate financial backing of the government, so that perhaps the size of its solvency margin is not as critical as for a private company. Nevertheless, even if the position is acceptable to the supervisory authority, it must adversely affect its standing in international reinsurance markets.

The level of a company's solvency margin not only has an important bearing on its financial security but also on the profitability of its operation, as measured by the rate of return on capital employed. As illustrated in the hypothetical examples in Tables 10.14 and 10.15, which assume a constant insurance profit (i.e. underwriting profit plus investment income on technical funds) and an annual rate of interest on shareholders' funds of 5 per cent, the rate of return on capital employed varies inversely to the size of the solvency margin.

---

(1) Although the three Egyptian direct insurers are roughly equal in size of premium income and scope of operations, the National specialises in handling the Egyptian marine hull and the Misr deals with aviation hull, while the three compete for all other insurance business.

Figure 10.7

Solvency Margins of Two Iraqi Companies.

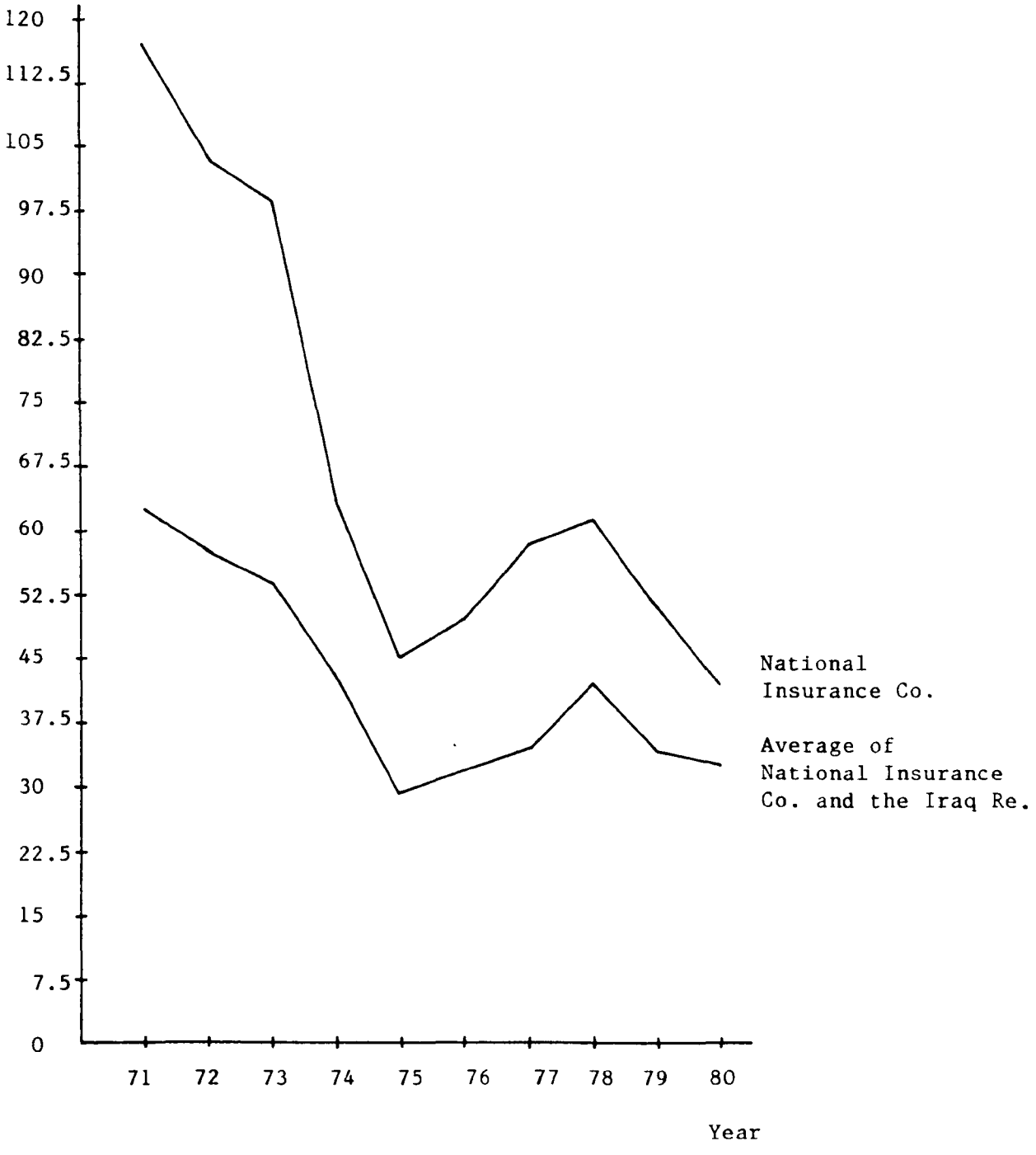


Figure 10.8
Solvency Margins of Four Egyptian Companies including the Egyptian Reinsurance Co.

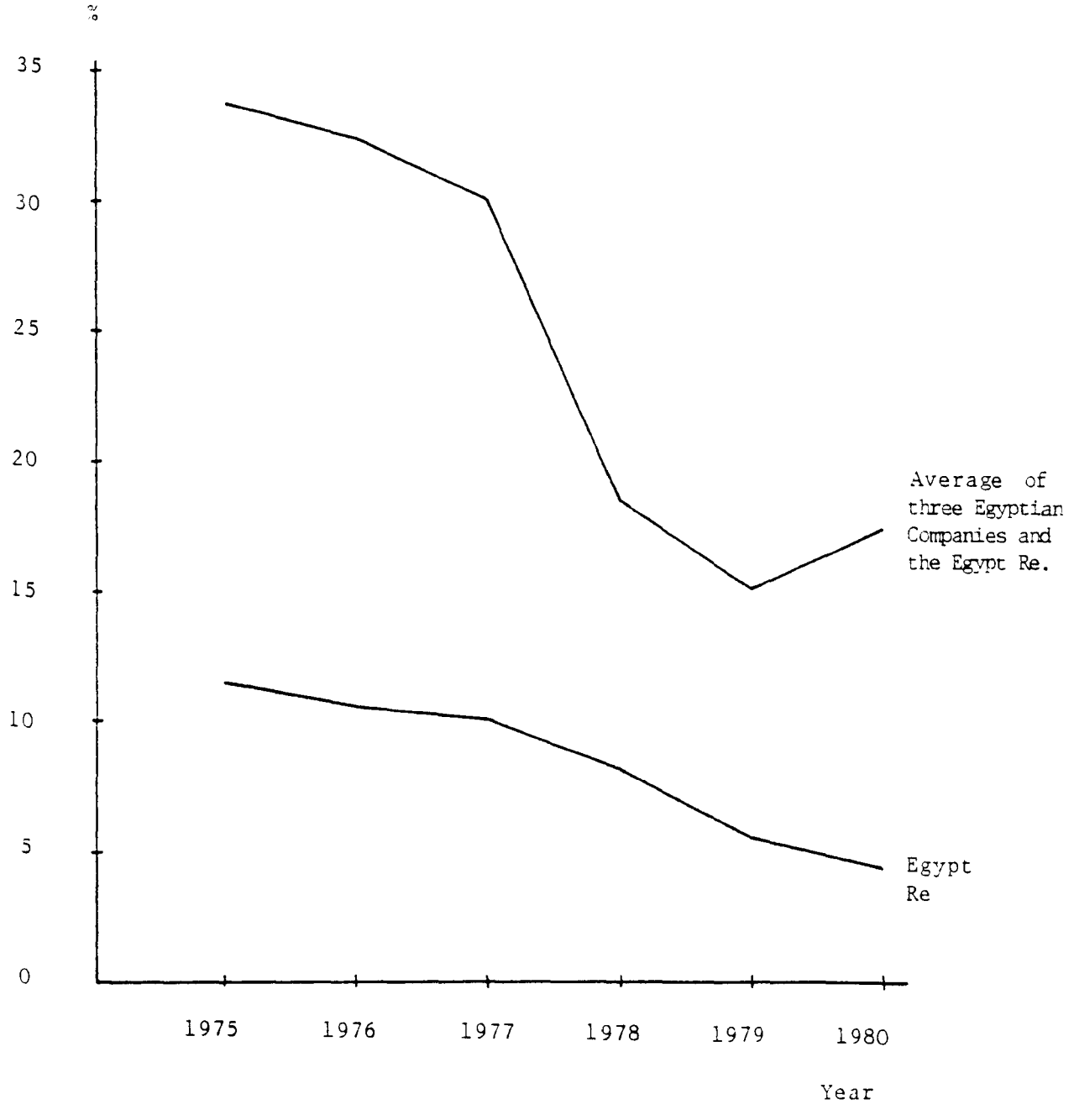


Table 10.14

Underwriting and Investment Profits as % of Shareholders' Funds

Premium Income (net of reinsurance)		$50,000
Underwriting profit		0
Technical Funds	$50,000	
Investment Income on Technical Funds (at 5%)		2,500
Underwriting Profit and Income on Technical Funds		2,500
Shareholders' Funds (40% solvency margin)	$20,000	
Investment Income on Shareholders' Funds (at 5%)		1,000
Total profit		3,500
Total profit as % of shareholders' funds:		
Underwriting profit and Income on Technical Funds		12.5%
Shareholders' Income		5.0%
Total pre-tax return on capital employed		17.5%
Total profit as % of net premium income		7.0%

Table 10.15

Insurance Profit as a Percentage of Shareholders' Funds Assuming Total Profit Equals 7% of Premium Income

Level of Solvency	Rate of Tax		
	Nil	20%	40%
	%	%	%
15%	46.7	37.4	23.0
35%	20.0	16.0	11.6
55%	12.7	10.2	8.5

Solvency Margins and Retention Limits

During the last decade, the solvency margins of many insurers world-wide have come under pressure because of the large increases that have occurred in their premium incomes due in considerable measure to inflation. Apart from those periods in some countries where rises in the market values of invested assets have counter-balanced the rise in premium income, for companies unable to raise additional capital the need to maintain solvency margins above a statutory minimum level has acted as a constraint on the growth of retained premium income.

One of the simplest means that an insurer can use to control retained premium income is quota share reinsurance. For example, if an insurer with capital and free reserves of $20 million writes a gross premium income of $400 million, by reinsuring its business under a quota share treaty it can adjust its solvency margin simply by varying its quota share retention, as shown in Table 10.16. If it had to maintain a minimum solvency margin of 10 per cent of retained premium income, the company could not afford to retain more than 50 per cent of its business for its own account.

If the objective is to ensure that a company at all times has sufficient free resources to maintain a target probability of ruin, then in determining the solvency margin as a percentage of retained premium income an insurer (or supervisory authority) should recognise that the size of the fluctuations in aggregate claims costs relative to the expected costs tends to vary iniversely to the size of the insurance portfolio. Therefore Pentikainen (1982, p 4.2-1) has

Table 10.16

Solvency Margin and Quota Share Reinsurance

(Figures in million)

	10% Retention	20% Retention	40% Retention	70% Retention
Gross premium income	$400m	$400m	$400m	$400m
Retained premium income	$ 40m	$ 80m	$160m	$280m
Capital and free reserves	$ 20m	$ 20m	$ 20m	$ 20m
Solvency margin	50%	25%	12.5%	7.1%

demonstrated that if a company maintains a constant retention limit, the minimum solvency margin required to maintain a given probability of ruin will fall as retained premium income increases. However, if the level of retention is determined according to the company's size, the minimum solvency ratio depends only very slightly on company size because some of the basic variables which affect solvency (e.g. market underwriting cycles, asset values, etc) are not affected by company size.

An insurance company's solvency margin is affected, however, not only by the amount of business it writes and the proportion which it cedes to reinsurers, but also by the price it pays for reinsurance. The larger is the reinsurer's loading of the risk premium for the expected claims costs transferred, the smaller will be the net income, and therefore assets, retained by the ceding company to meet retained claims. Therefore the higher the premium loading required by reinsurers, the greater is the incentive for an insurer to increase its retention limits. However, the closer is its solvency margin to the statutory minimum the less can it

afford to increase its retained premium income.

The cost of reinsurance also directly affects a company's profitability. The expected net income (excluding investment earnings) that will be obtained from writing additional business will be:

additional gross income less additional expected net costs

where: gross income = gross premium income

expected net costs = expected claims costs
plus original expenses and commission
plus reinsurance premiums (net of commissions)
less expected reinsurance claims recoveries

If the size of the reinsurance premium loading is so high that by writing more business and in turn ceding more to reinsurers, a company may suffer a reduction in its expected net income, the way both to protect its solvency margin and increase profits would be to reduce gross premium income and reinsurances ceded. Preferably such cuts would be achieved by reducing the company's acceptance limits rather than by curtailing the number of risks insured.

To summarise, the need to maintain a prescribed minimum solvency margin expressed as a percentage of retained premium income acts as a constraint on the growth of retained premium income. If a company is unable to achieve an increase in its solvency margin (i.e. the excess of assets over liabilities) by:

(a) raising additional capital from its owners (and in a free enterprise company, as opposed to a state corporation, that will require the company to offer a return equal to that obtainable

from other investments); or

(b) increasing free reserves out of retained profits; or

(c) enjoying an increase in asset values due to a rise in market values (though valuation regulations are applicable here);

then it must reduce (or at least limit) the growth of retained premium income by either:

(a) restricting growth of gross premiums; or

(b) reducing retention limits, so that a higher proportion of its gross premiums are ceded to reinsurers but as noted above, account must be taken of the price required by reinsurers.

10.8 Conclusions

Uncertainty as to future conditions and events should be a reason for the management of an insurance or reinsurance company trying to formulate its corporate objectives, and not an excuse for not doing so. The overall performance of an organisation is dependent upon its parts. Therefore all of the top functional managers - underwriters, actuaries, investment, financial, etc. - should participate in the exercise, and in formulating policies designed to achieve the chosen objective(s), consideration must be given to the company's reinsurance arrangements, including its retention limits.

One of the difficulties is that amongst any list of corporate objectives some may conflict, so that policies usually need to be designed so as to achieve a balance between desired objectives rather than seeking to maximise any single objective.

The questionnaire sent to 143 Arab insurance companies listed nine possible corporate objectives. The number of replies (46 indicated that many Arab insurers do set themselves objectives, with "providing a service to clients at a fair price" emerging as overwhelmingly the main primary objective. That finding differed from the results of two surveys in the UK and Australian insurance markets, which indicated that profit was the prime aim of their insurers.

As shown in Chapter 9, a number of variables should enter into the determination of retention limits. It follows that the objective(s) which a company seeks to pursue must influence its decisions regarding appropriate forms of reinsurance and the size of its retention limits. This chapter has shown how different corporate objectives, notably profit, growth and financial security, may require a company to modify its retention limits, and how one objective may act as a constraint on the levels of retention limits and retained premium income which otherwise may be desirable for the attainment of some other objective.

Appendix 10.1

THE UNIVERSITY OF NOTTINGHAM

Head of Department
PROFESSOR D. S. LEES
B.Sc.(Econ.), Ph.D.

DEPARTMENT OF INDUSTRIAL ECONOMICS
UNIVERSITY PARK
NOTTINGHAM NG7 2RD
UNITED KINGDOM
Telephone 56101

Date as Postmark

Dear Sir

I am a PhD student at the University of Nottingham studying with Professor R L Carter and engaged in research entitled "International Insurance and Reinsurance Transactions in the Arab World". Enclosed is a questionnaire on corporate objectives of insurers and reinsurers. It is part of the thesis on the subject and I would be very grateful if you could complete and return it as soon as possible in the addressed envelope provided. The answers to the questions will be treated as strictly confidential and no firm will be identified. The questionnaire aims to be as straightforward as possible and most of the answers are completed by ticking the box opposite the appropriate answer.

Your urgent reply would be very much appreciated.

Yours faithfully

Abdul Zahra A Ali

enc

Questionnaire:

Corporate Objectives of Insurers and Reinsurers in the Arab World
(Non-Life Business)

1. Type of Ownership (please tick appropriate box)

State ☐ Private ☐ Mixed ☐ Co-operatives ☐

Foreign Subsidiary ☐ Owned by local interests & foreign company ☐

2. How long established (please tick the appropriate box)

0-5 years ☐ 6-10 years ☐ 10-20 years ☐ 20-30 years ☐

Over 30 years ☐

3. Do you have formal/explicit corporate objectives? Yes ☐ No ☐

4. What is the prime objective of your company? Please rank the following list of objectives in order of importance for your company, ie. 1 = most important; 2 = second important; 3 = third important, etc.

a. To provide a service for insured clients at a fair price ..... ☐

b. To maintain the financial strength of the company ..... ☐

c. To maximise profits for the coming year ..... ☐

d. To maximise profits over five years ..... ☐

e. To increase dividends to shareholders ..... ☐

f. To achieve satisfactory level of profit ..... ☐

g. To maximise the growth of gross premium income ..... ☐

h. To maximise the growth of retained premium income ..... ☐

i. To increase market share ..... ☐

j. Others (please list) .....

.....

.....

.....

5. Are the retention limits of your company's reinsurance treaties fixed with regard to:

a. Capital and free reserves? Yes ☐ No ☐

b. Net retained premium income? Yes ☐ No ☐

6. Which of the following factors were considered as most important when your company last fixed its treaty retention limits? Please rank them in order of importance as in question 4 above.

a. Maintaining the financial strength of the company ..... ☐

b. To permit expansion of the gross premium income ..... ☐

c. To increase retained premium income ..... ☐

d. To limit retained premium income ..... ☐

e. To minimise reinsurance costs ..... ☐

f. Others (please list) .....

.....

.....

.....

7. How often are the retention limits of your reinsurance treaties revised? (Please tick appropriate box):

Annually ☐ Every two years ☐ Every three years ☐

Every four years ☐ More than four years ☐

Should any of your answers require elaboration, please add below.

The geographical distribution of the questionnaires and the number of returns are shown below:

No.	Country	Number of questionnaires sent	Number of Respondents
1	Algeria	4	-
2	Bahrain	12	3
3	Dujibotti	1	-
4	Egypt	7	3
5	Iraq	2	2
6	Jordan	11	7
7	Kuwait	9	4
8	Lebanon	16	5
9	Libya	2	2
10	Morocco	9	-
11	Mauritania	1	-
12	Oman	4	2
13	Qatar	5	-
14	Saudi Arabia	18	4
15	Somalia	1	1
16	Sudan	10	3
17	Syria	2	-
18	Tunisia	4	3
19	U.A.E.	18	4
20	N. Yemen	6	2
21	S. Yemen	1	1
Total		143	46

CHAPTER ELEVEN

RETENTION LIMITS ACCORDING TO DIFFERENT FORMS OF REINSURANCE

11.1 Introduction

The last two chapters have examined various factors, such as an insurer's size, financial condition and corporate objectives; the cost of reinsurance; the risk characteristics of different classes of insurance; etc., which in principle ought to influence insurers in fixing the general levels of their retention limits. Only brief references have been made to retentions being varied according to the type of reinsurance selected.

An insurer's operational results, and indeed its solvency, can greatly depend upon the type of reinsurance programme it arranges. That involves both selecting the forms of reinsurance to be employed for the various classes of insurances written, and deciding on the appropriate retention limits. Therefore, the purpose of this chapter is threefold:

(a) to discuss the variations in retention limits appropriate to the main forms of reinsurance (i.e. quota share reinsurance, stop loss, surplus, per risk excess of loss and catastrophe excess of loss);

(b) to demonstrate how retained premium income is affected by the type of reinsurance involved and to show the suita-

bility of a particular form of reinsurance for a particular class of business; and

(c) to compare empirically some reinsurance programmes to see how they play a decisive role in determining the size of retained premium income.

11.2 Retention for the Entire Portfolio

Both quota share and stop loss reinsurances may be said to provide total portfolio protection in the sense that:

(i) both provide cover against the aggregate losses incurred over the year on all policies included within the scope of the reinsurance treaty; and

(ii) both thereby afford protection against increases in claims frequency and/or claims size, though unlike a stop loss reinsurance, a quota share treaty provides no protection against aggregate claims costs in any one year exceeding some predetermined sum.

11.2.1 Retention Under Quota Share Reinsurance

The correct level of retention depends on a combination of many factors, i.e. a company's financial base, premium volume, claims experience etc., all of which have been discussed already in Chapter nine. However, under a quota share treaty, the size of the retention will often be determined primarily according to the desired retained premium income rather than the size of the individual risk exposure, which is a feature of surplus and per

risk excess of loss reinsurances. Often past claims experience of a certain class of business provides a fairly reliable indicator of both future expected aggregate claims costs and potential fluctuations therein, so that an insurer, when fixing the retention limits of his quota share treaty, will tend to depend on such past claims data. However, sometimes past claims experience may mislead the insurer, as shown by the following example taken from Iraqi motor comprehensive insurance. The claims as a percentage of gross premium income of this class of business during the period 1971-1976, ranged from 41.2 in 1971 to 56.1 in 1976; this might be called a normal fluctuation, but in 1977 the claims ratio sharply increased to 134.4.

Table 11.1

Gross Claims as % of Premium Income for Motor Comprehensive Insurance

Year	Gross Claims Ratio
1971	41.2
1972	46.0
1973	45.4
1974	42.1
1975	46.5
1976	56.1
1977	134.4

Source: Annual Reports of the National Insurance Co., Iraq.

Clearly past experience alone is not sufficient for a decision to be taken on what size of retention an insurer should fix for a quota share treaty. Other important factors need to be taken into account, notably:

(i) what is the absolute aggregate amount of a loss he can afford to retain in a certain class of business?

(ii) what claims ratio should be anticipated in the class of business involved for the term of reinsurance envisaged? (Gerathewohl, 1980, p.146). There are two factors related to the first question. Firstly, the amount of capital and free reserves available if claims incurred in any year exceed earned premiums (net of commissions and expenses) plus the investment earnings attributable thereto. Secondly, how many years in succession the company can afford to sustain such losses, which depends on the size of its solvency margin relative to any minimum figure prescribed by the insurance supervisory regulations of the country (or countries) in which it operates. The closer is the solvency margin to the statutory minimum the less risk can a company afford to take, and so the lower must be its retention limit in order to keep the potential fluctuations in its aggregate claims costs within a tolerable upper limit. A succession of bad years may, therefore, force a company to reduce its quota share retention.

Regarding the claims ratio to be anticipated for any class of insurance, the more uncertain is an insurer as to possible claims cost outcomes, the more conservative it needs to be in fixing its retention limits. Allowance needs to be made not only for the possibility of the aggregate claims costs for one class of insurance

substantially exceeding the expected cost, but also for the same happening with other classes, thereby seriously depleting the solvency margin.

The nature of the reinsurance programme arranged by an insurer will affect not only its potential solvency but also the volume of its retained premium income. For example, if a quota share reinsurance treaty is arranged to protect a marine cargo account the proportion of the gross premium income retained by the ceding company will depend, ceteris paribus, on whether the treaty operates on a retention "any one bottom" or "any one policy" basis, as shown by the following example:

Example

Assume: (i) an 80 per cent quota share with a treaty limit of $2 million

(ii) the account includes 40 policies each with a sum insured of $300,000, the cargo in respect thereof being loaded on six vessels as follows:

		Aggregate insured sums
Vessel U	(15 policies x $300.000 each)	$ 4.500.000
Vessel V	(9 " " ")	$ 2.700.000
Vessel W	(7 " " ")	$ 2.100.000
Vessel X	(5 " " "	$ 1.500.000
Vessel Y	(2 " " ")	$ 600.000
Vessel Z	(2 " " ")	$ 600.000
		$12,000,000

The amounts retained and ceded to reinsurers would be:

(a) 'any one bottom basis':

	Aggregate insured sums	Retained by ceding company (20%)	Ceded to reinsurers: Quota Share (80%)	Ceded to reinsurers: Facultative
Vessel U	$4.500.000	$ 400.000	$1.600.000	$2.500.000
Vessel V	$2.700.000	$ 400.000	$1.600.000	700.000
Vessel W	$2.100.000	$ 400.000	$1.600.000	100.000
Vessel X	$1.500.000	$ 300.000	$1.200.000	-
Vessel Y	$ 600.00	$ 120.000	$ 480.000	-
Vessel Z	$ 600.000	$ 120.000	$ 480.000	-
		$1.740.000	$6.960.000	$3.300.000

(b) 'any one policy basis':

Each policy of $300.000	$ 60.000	$ 240.000	-
Total of 40 policies	$2.400.000	$9.600.000	-

From the above example it can be seen that retentions based on an 'any one policy' would provide the insurer with a higher retained premium income than on an 'any one bottom' basis. However given the likelihood of cargoes insured under more than one policy being loaded on the same vessel, a retention limit based on "any one policy" would leave the ceding company with the risk of incurring higher retained losses as the result of the loss of one ship. To compensate for that risk the company would need to accept a lower retention limit if it chose to reinsure on that basis.

When a quota share reinsurance treaty is arranged to cover both marine cargo and hull risks, the treaty will often separate retentions for each type of insurance. In fixing his retentions,

the insurer then must consider the possibility of hull and cargo losses accumulating.

11.2.2 Retention Under Stop Loss Reinsurance

The retention (priority), as well as the limits, in a stop loss cover are expressed as a percentage of an insurer's net premium income for the portfolio protected; they may also be shown as absolute amounts. The minimum retention applicable under a stop loss cover in a certain class of insurance is the insurer's actual administration expenses for the class in question, plus the expected (i.e. annual average) aggregate retained annual claims cost. At such a retention level the stop loss reinsurer will become liable when the acquisition and administration costs, plus losses retained, exceed the premiums retained by the insurer after allowing for the contingency and profit loadings in the original and reinsurance premiums ceded. If the ceding company's retention under a stop loss cover was below that level it would guarantee the insurer a profit.

Moreover, the reinsurer may require the insurer to retain usually between 5 and 10 per cent of any loss above the deductible for his own account. Thus by also requiring the retention to be fixed at a level which ensures that the ceding company incurs an underwriting loss before the stop loss reinsurance protection operates, the reinsurer ensures that the company will remain interested in properly underwriting the risks it accepts.

Gerathewohl (1980, p.100) has pointed out that premium

growth may have a considerable influence on the level of retention. For example, a significant increase in premium rates due to increased claims expenditure may reduce the expense ratio if expenses increase at a lower rate than claims. Therefore a retention which was technically correct in one year may be too low in a subsequent year in that the reinsurer could be liable to contribute before the insurer loses money. Also when the treaty limits are expressed as percentages of the ceding company's premium income, an increase in the premium income will raise the absolute values of both the ceding company's retention and the reinsurer's maximum liability.

The average claims ratio experienced, and the claim fluctuations an insurer has to expect on the basis of a number of years' past results, are of great importance in calculating the level of the retention. However, as with other forms of reinsurance, many other variables including the special factors outlined above should also be taken into account.

When considering how important stop loss covers are for an insurer two perspectives need examination. Firstly, Borch (1974, p.9) like Verbeck a few years earlier (1966, pp. 26-38) has indicated that stop loss cover is better than other forms of reinsurance for protecting a whole portfolio of risks and may even be the cheapest form of reinsurance. He argues that:

> "We can say that this is the 'most efficient' form of reinsurance since it gives the greatest reduction in the variance of the portfolio for a given net premium. Whether it also is the cheapest form will depend on the loading. If the loading for all kinds of reinsurance is a fixed proportion of the net premium, stop loss will also be the cheapest form of reinsurance.Should the loading be some function of the variance, for instance, proportional to the standard deviation, it will be a matter of subjective judgment,

whether stop loss is better than other forms of reinsurance."

In practice, however, there are contrasting opinions to those expressed by Verbeck and Borch. Many insurance and reinsurance experts have stressed that stop loss covers are very difficult to handle; they also give a warning on the unpleasant consequences of underwriting such covers. Kiln (1981, p.268), for example, has said:

> "It is my firmly held belief that stop loss programmes used to cover a whole account on a long term basis, often turn out to be disadvantageous to the reassured and reinsurers alike, and that such contracts, to replace the more normal methods of pro rata and/or excess of loss reinsurance, are very dangerous animals which can only be undertaken successfully by highly trained people with phlegmatic temperaments and considerable cash resources".

Lavers (1979, p.9) has also stressed that stop loss covers are the most dangerous form of reinsurance to underwrite. Therefore, he argued that stop loss covers should be avoided by reinsurers unless the following conditions are met;

1. The maximum priority should be 100 per cent of the insurer's net premium income.
2. The insurer should incur an underwriting loss of at least equal to 5 per cent of premium income before the stop loss cover pays.
3. No one loss or event should take away more than 10 per cent of the premium income.

Of course, the buyer of a stop loss cover or any other form of reinsurance, is unlikely to share a reinsurer's views as to what constitutes the ideal terms and conditions. The reinsurer always intends to obtain some profit from the risks he reinsures whereas the ceding company will aim to reduce its reinsurance costs

and improve its net (of reinsurance) underwriting results. Consequently in practice the terms of all reinsurance treaties are likely to represent a compromise between the opposing desires of the two parties.

11.2.3 A Comparison of the Results of Quota Share and Stop Loss Treaties

Having considered the two forms of reinsurance separately, the respective results for an insurer of employing each form to protect a particular account will now be examined.

Complete equivalence of a quota share treaty and stop loss cover in a specific case is virtually a theoretical concept because, in practice the conditions required to provide such equivalence will be found only under exceptional circumstances. According to Sousselier (1955, pp.1171-2) these circumstances are: (i) when a quota share treaty includes a profit commission of 100 percent (which is highly unlikely in practice); (ii) when the stop loss deductible, together with the premium payable for it is not more than 100 per cent (which may quite possibly be the case); and (iii) when the stop loss cover provides unlimited liability. With the sort of terms encountered in practice the outcomes from using the different forms of reinsurance will vary, so that in some cases a quota share treaty will produce the more favourable results for the ceding company, whereas in other cases a stop loss cover will prove best. This is illustrated by the following example:

Example

Assume that an insurer has the choice of protecting an insurance portfolio with a gross premium income of $1 million by:

either a stop loss reinsurance treaty with limits of 50 per cent excess of a 75 per cent claims ratio, subject to:

- the ceding company retaining 10 per cent of the reinsured losses; and
- a reinsurance premium of 5 per cent of the ceding company's gross premium income, i.e. $50,000;

or quota share with a sliding scale commission, providing a maximum commission of 30 per cent (corresponding to the original expenses) for a loss ratio of up to 65 per cent and thereafter with the commission falling by ½ per cent for every 1 percent rise in the loss ratio up to 85 percent, i.e:

Loss ratio	Reinsurance Commission rate
65%	30%
75%	25%
85%	20%

It is further assumed that the insurer's expense ratio is equal to 30 per cent of the original premiums (so that a loss ratio of 70 per cent would yield a zero underwriting result).

By choosing either form of reinsurance the effect on the insurer's net underwriting result would be as shown in Table 11.2.

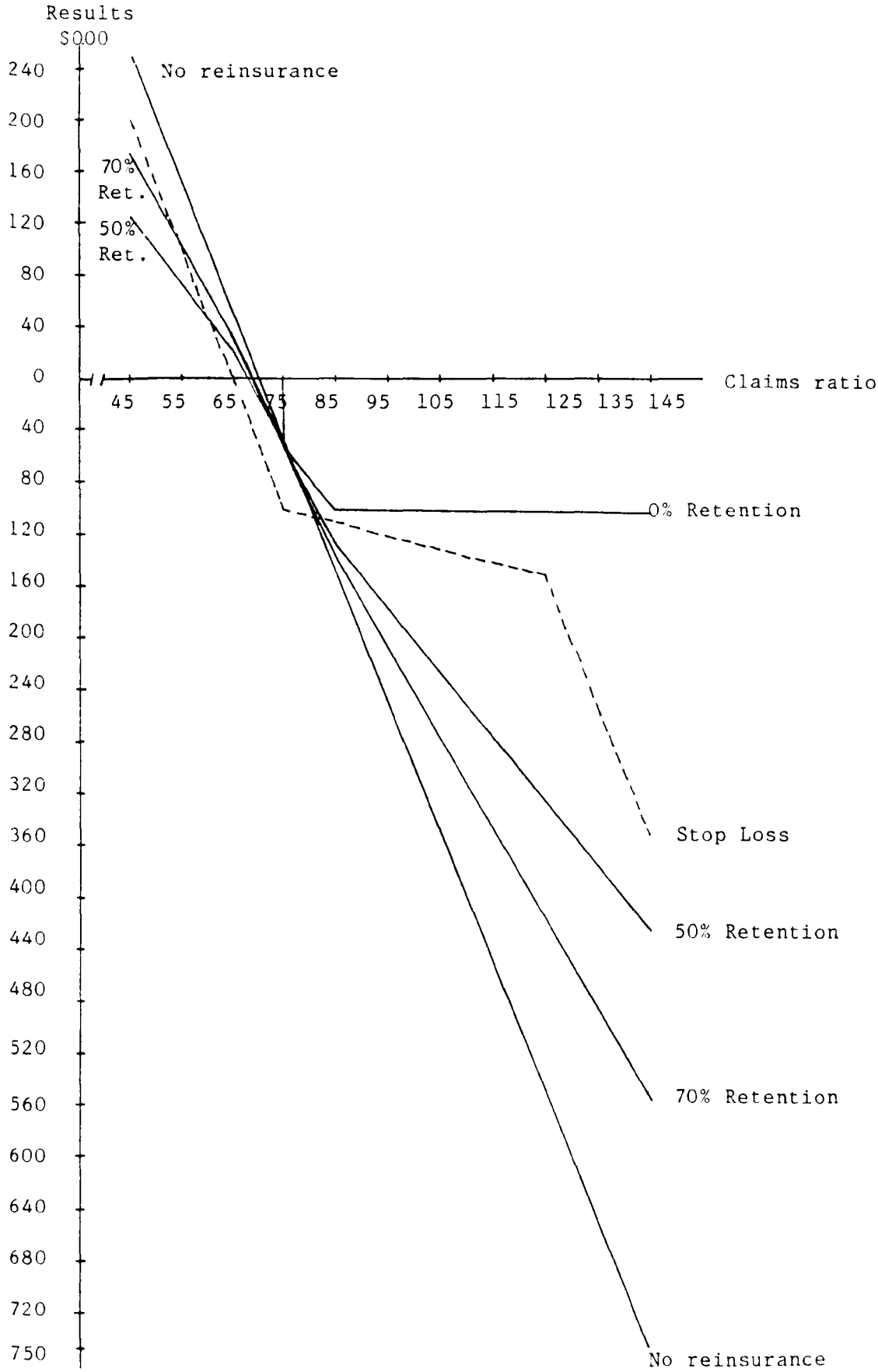
As compared with the position if the insurer effected no reinsurance (line (c)), both forms of reinsurance reduce the size

Table 11.2

The Results of effecting (a) Quota Share and (b) Stop Loss Reinsurance Treaties

Type of reinsurance	The insurer's underwriting result with a gross claims ratio of:								
	45%	55%	65%	75%	85%	95%	105%	125%	145%
(a) Quota share:	$000	$000	$000	$000	$000	$000	$000	$000	$000
0% retention	0	0	0	- 50	-100	-100	-100	-100	-100
50% retention	125	75	25	- 50	-125	-175	-225	-325	-425
70% retention	175	105	35	- 50	-135	-205	-275	-415	-555
(b) Stop Loss	200	100	0	- 100	-110	-120	-130	-150	-350
(c) No reinsurance	250	150	50	- 50	-150	-250	-350	-550	-750

Figure 11.1
The Results of Quota Share with Different Retentions
Compared with Stop Loss Cover



of the fluctuations in the underwriting result, but at the cost of a reduction in the profit which would be earned if the loss ratio fell below 70 per cent. 100 per cent reinsurance would produce the narrowest range of outcomes. Otherwise the stop loss reinsurance would produce a better outcome for the insurer if the loss ratio diverged substantially from the expected figure of 70 per cent. All of the results are plotted in Figure 11.1.

As a further test of how an insurer's underwriting results on its retained account may vary depending on (a) the type of reinsurance employed, and (b) the gross claims ratio, an Arab insurance company provided details of the premium income and claims experience on its general third party liability account and of the following terms which it was quoted for a quota share and a stop loss reinsurance:

1. a quota share treaty with 35 per cent commission (which corresponded to its original expense ratio); and
2. a stop loss cover for 50 per cent in excess of 100 per cent loss ratio, with a reinsurance premium rate of 5 per cent of the original premiums.

The company was not willing to disclose (i) whether there was a profit commission on the quota share treaty; or (ii) whether it was required to participate in the reinsured losses under the stop loss cover.

Table 11.3 provides details of what would have been the company's underwriting results over eleven years if either of the two types of reinsurance had been in force subject to the above terms, and assuming four possible retention levels with the quota share

Table 11.3

Results of both Quota Share and Stop Loss Reinsurance Treaties

Year	Premium Income	Losses	Loss Ratio	Quota Share 10% retention	Quota Share 20% retention	Quota Share 50% retention	Quota Share 80% retention	Stop Loss
	US$	US$		US$	IS$	US$	US$	US$
1	100.000	45.000	45	+ 2.000	+ 4.000	+10.000	+16.000	+15.000
2	111.000	60.500	55	+ 1.100	+ 2.200	+ 5.500	+ 8.800	+ 5.500
3	130.000	162.500	125	- 7.800	-15.600	-39.000	-62.400	-52.000
4	140.000	105.000	75	- 1.400	- 2.800	- 7.000	-11.200	-21.000
5	150.000	97.500	65	0	0	0	0	- 7.500
6	160.000	136.000	85	- 3.200	- 6.400	-16.000	-25.600	-40.000
7	180.000	153.000	85	- 3.600	- 7.200	-18.000	-28.000	-45.000
8	200.000	370.000	185	-24.000	-48.000	-120.000	-192.000	-150.000
9	220.000	209.000	95	- 6.600	-13.200	-33.000	-52.800	-84.000
10	240.000	252.000	105	- 9.600	-19.200	-48.000	-76.800	-96.000
11	260.000	403.000	155	-23.400	-46.800	-117.000	-187.200	-117.000

reinsurance. In this case the pattern of underwriting results would have been entirely different to that of the first example in that with a loss ratio of between 65 and 125 per cent a quota share treaty at any of the retention levels would have produced better results than the stop loss treaty. Only at the extremes of the loss ratio range would the stop loss cover have given better results than some of the quota share options : in years 2 and 11 it would have produced an identical result to that which would have been obtained from a 50 per cent quota share treaty.

One may conclude from Table 11.3 that when selecting reinsurance cover the insurer will have to consider two points: (i) the level of retention he finds suitable for a specific situation, and (ii) the claims ratio he anticipates for the coming year(s). However the choice of a quota share reinsurance or stop loss cover will also be affected by several other factors, such as the degree of variation in claim ratio fluctuations, the cost of reinsurance protection, the long-term or short-term security provided by the reinsurer, etc. In this contect Gerathewohl (1980, p.113) writes:

> "When comparing stop loss with quota share reinsurance in a specific case, one must note that any decision for or against one of these alternatives will be largely influenced by factors that cannot always be measured objectively. This is one of the reasons why direct insurers often choose a dual approach and take out a quota share reinsurance with a stop loss cover on the quota retention".

11.3 Retention Per Risk

Unlike quota share and stop loss treaties, surplus reinsurance and per risk excess of loss cover (PRXL) are the two forms of reinsurance most suitable for portfolios whose claims ratios are subject to random fluctuations caused by the occurrence of large losses affecting individual risks. Per risk retentions for these two types of reinsurance will be discussed separately.

11.3.1 Retention Under Surplus Reinsurance

The principle of a surplus treaty is to allow an insurer to retain those small risks which he is capable of keeping for his own account. Thus the premiums ceded away are proportionate to the potential claims liabilities transferred to the reinsurer in respect of individual risks written by the ceding company with sums insured exceeding its retention limit. Therefore the company will retain a larger proportion of its total original premium income by employing a surplus reinsurance treaty than with a quota share treaty designed to limit its maximum retained loss for any one risk to the same figure as its surplus retention limit. This can be seen in the following example which is based on a fire portfolio. First, it is assumed that:

(i) the company fixes a uniform retention limit of $400,000; and

(ii) arranges a surplus treaty which provides cover up to a maximum $10,000,000 any one risk (i.e. 24 surplus lines).

Given a distribution of risks by size of sum insured as shown in Table 11.4,all policies with sums insured that fall into classes 1 to 6 are within the insurer's retention limit, whereas reinsurance is required for policies in classes 7 to 14, with the reinsurance ceded varying from 11.1 percent to 96 percent. The total retained premiums are $20.913.092 or 84.1 per cent and the reinsurance premiums before deduction of reinsurance commission are $3.960.208 or 15.9 per cent.

If instead of arranging a surplus treaty the company chose to rely principally on a quota share reinsurance, in order to limit its maximum retained loss to $400,000, and at the same time provide the reinsurers with a well-balanced treaty, the company might arrange an 80 percent quota share subject to a treaty limit of $2 million. It would then also need to obtain additional facultative cover for cases in classes 11 - 14. The distribution of the original premiums with such a reinsurance programme would be as shown in Table 11.5, with the proportion of the gross premium income retained by the company falling from the 84.1 per cent with the surplus treaty to only 19.2 per cent. Thus the premium income that would be retained under the surplus treaty is more than 4 times higher than under the quota share arrangement. However with the surplus treaty the ceding company would be exposed to all of the variability in claims costs for the smaller cases in classes 1 - 6 which it wholly retains for its own account and it would lose the benefit of the additional reinsurance commission deductible from the extra quota share and facultative reinsurance premiums.

Reference has been made in Chapters 5 and 9 to the growing

Table 11.4

Premium Retained and Ceded in Surplus Treaty

No.	Average sum insured per risk	Number of policies	Gross premium per class	Retention		Reinsurance	
				%	Gross Premium	%	Gross Premium
	$		$		$		$
1	9,000	300,000	2,970,000	100	2,970,000	-	-
2	18,000	180,000	3,564,000	100	3,564,000	-	-
3	30,000	80,000	2,880,000	100	2,880,000	-	-
4	60,000	45,000	3,240,000	100	3,240,000	-	-
5	110,000	20,000	2,860,000	100	2,860,000	-	-
6	200,000	7,000	1,960,000	100	1,960,000	-	-
7	450,000	3,000	2,025,000	88.9	1,800,225	11.1	224,775
8	720,000	1,200	1,382,400	55.6	768,614	44.4	613,786
9	1,000,000	620	1,054,000	40.0	421,600	60.0	632,400
10	1,500,000	310	837,000	26.7	223,479	73.3	613,521
11	2,500,000	150	712,500	16.0	114,000	84.0	598,500
12	3,200,000	80	512,000	12.5	64,000	87.5	448,000
13	5,400,000	30	356,400	7.4	26,374	92.5	330,026
14	10,000,000	20	520,000	4.0	20,800	96.0	499,200
		637,410	24,873,300	84.1	20,913,092	15.9	3,960,208

Table 11.5

Premiums Retained and Ceded in a Quota Share Treaty

No.	Average sum insured per risk $	Number of policies	Gross Premium per class $	Retention of sum insured up to $ 2m %	Gross Premium $	Quota Share Reinsurance %	Gross Premium $	Premium ceded for facultative reinsurance %	$
1	9,000	300,000	2,970,000	20	594,000	80	2,376,000	-	-
2	18,000	180,000	3,564,000	20	712,800	80	2,851,000	-	-
3	30,000	80,000	2,880,000	20	576,000	80	2,304,000	-	-
4	60,000	45,000	3,240,000	20	648,000	80	2,592,000	-	-
5	110,000	20,000	2,860,000	20	572,000	80	2,288,000	-	-
6	200,000	7,000	1,960,000	20	392,000	80	1,568,000	-	-
7	450,000	3,000	2,025,000	20	405,000	80	1,620,000	-	-
8	720,000	1,200	1,382,400	20	276,480	80	1,105,920	-	-
9	1,000,000	620	1,054,000	20	210,800	80	843,200	-	-
10	1,500,000	310	837,000	20	167,400	80	669,600	-	-
11	2,500,000	150	712,500	16	114,000	64	456,000	20	142,500
12	3,200,000	80	512,000	12.5	64,000	50	256,000	37.5	192,000
13	5,400,000	30	356,400	7.4	26,400	29.6	105,600	63	224,400
14	10,000,000	20	520,000	4	20,800	16	83,200	80	416,000
		637,410	24,873,300	19.2	4,779,680	76.9	19,118,720	3.9	974,900

practice of fire insurers basing their surplus reinsurance retentions on estimated maximum losses (EML) instead of sums insured. Suppose that in the above example the insurer calculated the EML of a risk with a sum insured of $10 million as $2 million. By maintaining the retention limit at $400,000 he would reduce the proportion ceded to the surplus reinsurers from 96 per cent to 80 per cent. The danger then lies in the possibility of EMLs being substantially under-estimated. If, for example, the above risk suffered a loss net of 20 per cent but of 80 per cent of the value at risk, as happened at Flixborough, the ceding company's net retained loss would be $1,600,000 as compared with its desired retention limit of $400,000.

Besides basing their retention limits on EMLs for fire insurances , some insurers have tried to extend the practice to engineering and construction insurances, though not very successfully because of the number of perils covered, each with differing loss potential characteristics. As for other classes of insurance which may be reinsured under surplus treaties, the EML basis is entirely inapplicable in the fixing of retention in such classes as life and personal accident, where all, or almost all, losses are total losses, as well as in aviation and marine where total losses may be possible, and where the extent of partial losses is difficult to determine. (Gerathewohl pp. 71-72).

11.3.2 Graded Retentions under a Surplus Reinsurance

Particularly for fire surplus reinsurances, insurers normally

do not adopt a fixed retention limit for all risk groups, but rather grade retentions in accordance to loss exposure with the least hazardous risks carrying the highest retention limits and vice versa.

The available evidence regarding this practice indicates that the relative scales in use vary considerably between insurers and some observers maintain that graded retention limits tend to be determined arbitrarily according to the premium rate, reducing as the rate increases, though not proportionately (I.I.L. 1955-56, p.94). The table of retention limits shown in Table 11.6 confirms that the practice has been adopted by at least some Arab insurers.

Table 11.6

The Fire Surplus Retention Table of an Arab Insurance Company

Premium Rate 0/00	Retention limit
Up to 1.5	500.000
1.5 to 3.00	420.000
3.01 to 5.00	320.000
5.01 to 7.00	240.000
7.01 to 10.00	160.000
10.01 to 15.00	80.000
15.01 to 20.00	40.000
20.01 to 30.00	26.000
Over 30.00	16.000

Note: no currency unit is shown for the retention limit in order to avoid the company being identified.

The validity of the general principle of grading retentions according to loss exposure is open to question. However, Gerathewohl (1980, p. 135) has reported that studies conducted into the experience of West German industrial fire and loss of profits insurances lend some support to the practice. The loss experience over time revealed that there is a directly proportionate relationship between the mean value and the standard deviation of the claims rates of different classes of risk. In other words risk groups with low average claims rates experience smaller fluctuations in claims costs.

The counter argument is that if retention limits are to be graded the key factor should not be loss exposure as measured by loss expectancy but the size of the contingency loading built into the premium relative to the loss variance.

In any event grading retention limits according to market premium rates is fraught with danger in that a change in rate may be due more to the effects of competition than to a change in the underlying risk factors. Thus if as the result of an increase in competition the premium rate for a particular class of risk fell by 30 per cent from 4 per mille to 2.8 per mille, according to Table 11.6 the company should have increased its retention from 320,000 to 420,000.(1) As the reduction in the premium rate would have cut the profit and contingency loading of the premium, to increase the retention would be exactly opposite to what the company should have done according to the Benjamin's retention equation (see section

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(1) In the highly competitive market concerned in 1980, premium rates of various classes of insurance were reduced by not less than 25 percent in some classes.

9.3.5). Sometimes insurers recognise that fact.(1) Therefore, if retentions are to be graded according to premium rates the correct rate to use is the risk premium rate.

A risk premium is equal to the loss expectancy of the risk transferred to the insurer and so reflects the risk factors which determine loss frequencies and severities. In the case of fire insurance, the higher is the risk premium rate (which is applied to the sum insured to produce the risk premium) the higher is the insurer's loss exposure in terms of the loss expectancy, and so the lower would be the insurer's retention limit. A table of retention limits based on risk premium rates given by Gerathewohl is reproduced in Table 11.7. According to Gerathewohl (1982, p.76) such tables are common because of their simplicity of application and the continuity they provide in that regular revision of retention limits is not required.

An alternative system is to base retentions on certain key physical chracteristics of insured risks which are indicators of loss exposures. Under such a system retentions are generally graded according to the type of construction, the type of occupation the location of a risk, and the availability of external fire fighting facilities. The retention, for example, will be larger in risks suceptible to greater resistance to damage, and smaller in risks where a larger loss on the sum insured is possible (see Table 11.8).

(1) 'In ocean hull, where premium rates move up and down according to certain cycles, the direct insurer will be inclined to apply lower retentions at times of low premium rates, as he must anticipate medium size and small losses consuming a large share of the premium and leaving little or nothing over for large losses. The situation is similar in industrial fire'. (Gerathewohl, 1980, p.133).

Compared with the tables of retentions based on risk premium rates, tables of retentions based on risk circumstances are far more complicated to apply in practice. They generally require a high standard of underwriting expertise.

Table 11.7

Table of Retention for Fire and Fire Loss of Profits Insurances Based on Risk Premium Rates

Class	Average Risk Premium Rate	Retentions (Sum Insured or PML)
1	Up to 2.5‰	DM. 1,000,000
2	above 2.5‰ to 5.0‰	800,000
3	above 5.0‰ to 7.5‰	700,000
4	above 7.5‰ to 10.0‰	600,000
5	above 10.0‰ to 12.5‰	500,000
6	above 12.5‰ to 17.5‰	400,000
7	above 17.5‰	300,000

Source: Gerathewohl (1982, p. 916)

Note: "(1) The risk premium rate is the average risk premium rate derived from the fire and fire loss of profits insurances written.

(2) The retentions apply both to fire insurances alone and to fire and fire loss of profit together. In the case of fire loss of profits insurances alone these retentions are reduced by 50%."

Generally speaking, tables of retentions should be revised periodically and any modification should be made accordingly; such procedure will depend on the company's growth. A problem arises when the gross premium and the financial strength of the company

Table 11.8

Table of Retentions for Fire and Fire Loss of Profits Insurances based on Risk Circumstances

Type of Plant	Construction Class 1		Construction Class II	
	Location Class 1	Location Class 2	Location Class 1	Location Class 2
A	DM. 200,000	DM. 180,000	DM. 150,000	DM. 120,000
B	180,000	150,000	120,000	90,000
C	150,000	120,000	90,000	60,000

Source: As for Table 11.7 (p.917). See pages 917-8 for definitions of the type of plant, construction class and location class.

Note: As for note (2) in Table 11.7.

are growing rapidly yet the level of retention remains small; this applies exactly to the example which has been given in Table 11.6. Although the company is growing rapidly in terms of the gross premium written and financial strength, the graded table of retentions remained unchanged for the period 1977-1981 (figures provided in 1981). This, of course, has resulted in a decline in the retained premium income relative to gross premiums and a larger outflow of reinsurance.

11.3.3 Per Risk Excess of Loss Covers and the Level of Retention

A per risk excess of loss (PRXL) reinsurance cover is designed to protect a ceding company against the possibility of incurring large losses on individual risks. The reinsurer accepts liability for the balance of any individual loss exceeding a specified

sum, the amount of his liability normally being subject to an upper limit, that is, the cover is expressed as being for "£x in excess of £y". Therefore, the ceding company must decide not only at what level of loss it wishes the reinsurance to operate, but also the limit to the reinsurer's liability. The cost of such reinsurance is inversely related to the ceding company's lower retention limit and directly to the amount of the reinsurer's liability. Therefore if the company fixes a low retention limit to protect itself against an increase in the frequency of small losses, the reinsurance will lose its main advantage of enabling the company to retain a large proportion of its gross premiums. On the other hand, a too high retention will expose the company to large adverse fluctuations in retained claims costs.

Gerathewohl (1980, p.140) has argued that the level of retention that the insurer should select for a surplus reinsurance should always be higher than the retention of PRXL reinsurance covering the same business. The reason is that the insurer's retained claims cost is larger under a PRXL cover than under a surplus reinsurance treaty, and also under an excess of loss reinsurance the ceding company has no protection against an increase in the number of small claims on large risks that would be partially reinsured under a surplus treaty. The differences in retained claims costs under the two types of reinsurance are illustrated by the following example:

Example

Assume that:

(i) an insurer arranges either an excess of loss cover for $ 2 million in excess of $200,000, or a ten line first

surplus treaty with a gross line of $ 200,000.

(ii) that the following claims occur on risks with sum insured of $ 2.2 million for each risk.

The insurer's retained claims costs would be as follows:

Loss Amount	Retained claims cost under: Surplus Treaty	PRXL Cover
$	$	$
55,000	5,000	55,000
110,000	10,000	110,000
220,000	20,000	200,000
440,000	40,000	200,000
880,000	80,000	200,000
1,760,000	160,000	200,000
2,200,000	200,000	200,000
	515,000	1,165,000

Although the aggregate retained claims costs would be greater under the PRXL cover than under the surplus reinsurance, the insurer on the other hand would retain a larger proportion of the gross premium income than for a surplus reinsurance with the same retention limit. Nevertheless, the two important factors which a company should consider in fixing a PRXL retention are: (1) the loss fluctuations which it could retain for its own account, and (2) the rate charged by the reinsurer for the various retention levels. Therefore an insurer, in determining his PRXL's retention, should look at the size and frequency of losses for the previous years. Two systems employed for that purpose are the loss ratio and the loss frequency methods. The way they operate can be illustrated

by two examples using hypothetical data.

The Loss Ratio Method

As Reinarz has explained (pp. 112-4) this method depends on the variability in loss ratio of the portfolio to be reinsured. First the insurer needs to divide the loss experience for several past years into classes according to size of loss. The annual total losses for each class are then computed as a percentage of that year's earned premium income. Next the average loss ratio per class for the period in question can be obtained. The level of retention should be the point at which the average loss ratio begins to decline rapdily. Losses falling into the smaller size bands are suitable for retention because with their high loss frequency the deviation of actual losses from expected loss will tend to be small.

Table 11.9

Losses calculated as a Percentage of Annual Earned Premium

Class	Size of Loss	YEAR 1	2	3	4	5	6	7	8	Average loss ratio
	$									
1	1 - 4000	22	21	21	22	21	22	21	21	21.37
2	4001 - 6000	18	17	17	18	17	18	18	17	17.50
3	6001 - 8000	15	15	14	15	14	14	15	14	14.50
4	8001 - 10000	10	11	10	10	10	11	11	11	10.50
5	10001 - 13000	4	7	6	6	4	4	5	8	5.50
6	13001 - 16000	5	5	6	5	5	5	6	5	5.25
7	16001 - 19000	2	4	5	3	1	4	5	2	3.25
8	19001 - 22000	3	2	4	1	2	5	1	3	2.62
9	22001 - 25000	2	0	2	2	3	0	2	2	1.88
10	25000 and up	1	1	2	0	1	0	2	0	0.88
	Total Loss Ratio	82	83	88	82	78	83	87	83	83.25

Accordingly, for a portfolio displaying the sort of results shown

in Table 11.9 it would be appropriate to set the retention level at around $10,000. It is assumed that a variation of not more than five per cent from the eight year average loss ratio is the point beyond which the variation from the average is sufficient to be considered unpredictable.

The Loss Frequency Method

Like the loss ratio method, this method also focuses attention on the disturbing effect of large losses on aggregate claims experience. Again the total claims are broken down by size of claim but instead of calculating for each size band the loss ratio, the number of claims in each class is expressed as a percentage of the total number of claims to give the relative claims frequency. With this method the retention limit would be fixed at the size of loss where the loss frequency starts for fall significantly, for the same reason as applies with the loss ratio method. Thus the retention in Table 11.10 would be set around $13,000.

Both of these methods can be criticised on the grounds that they are based on ashort period loss experience which does not recognise some factors that should affect the level of retention, such as (i) possible changes in the insurer's portfolio during that time (e.g. a motor insurer that began to write insurances for heavy goods vehicles and buses as well as private cars) or in risk factors (e.g. inflation); and (ii) the insurer's capital resources. Also a difficulty with using either method is to choose appropriate size bands. For example, with the loss ratio method the broader the bands the

Table 11.10

Loss Frequency in Relation to Total Losses per $1000 of Claims

Size of Loss	% of Total Loss	
$ 1 - 4000	28	
4001 - 6000	23	
6001 - 8000	19	
8001 - 10000	16	
10001 - 13000	13	
13001 - 16000	5	Retention Level
16001 - 19000	4	
19001 - 22000	2	
22001 - 25000	2	
25000 and up	3	

smaller will tend to be the relative variations within those bands.

11.3.4 Graded Retentions for Per Risk Excess of Loss Treaties

For the same reasons as apply to surplus reinsurance, an insurer may consider the possibility of applying graded retention limits for an excess of loss treaty. In other words the treaty would be arranged with the deductible (and, possibly, the upper treaty limit) being varied according to the class of risk, as in the following example:

Class	Underwriting Limit	Insurer's Retention	Reinsurer's Liability
Risk Category I	$200.000	$60.000	$140.000
" " II	180.000	54.000	126.000
" " III	150.000	45.000	105.000
" " IV	100.000	30.000	70.000
" " V	80.000	24.000	56.000

In practice, graded deductibles are most unusual. As Carter (1981, p.2/10) explains in connection with marine non-proportional reinsurances, there is a technical problem in determining a fair premium for a per risk excess of loss treaty subject to graded retentions because:

(i) the overall premium for a reinsured portfolio is based on the total account rather than on the original premiums for the individual risks; and

(ii) changes in the content of the protected portfolio may lead to an increase or reduction in the reinsurer's liabilities without an appropriate adjustment in the reinsurance premium. Moreover, one of the advantages of excess of loss treaties is that the premium retained by insurers is larger than in proportional treaties. Therefore, there is little need to grade retentions, since high fluctuations in claims expenses can be covered by the retained premiums.

11.4 Retention Under Catastrophe Covers

As discussed in chapters 6 and 9, Arab insurance companies, like insurers in other parts of the world, are exposed to possible accumulations of losses from one loss producing event caused by either natural forces (e.g. earthquakes, windstorms, etc.) or human action (e.g. riots, strikes, etc.). Such losses may involve both many individual exposure units covered under one class of insurance and a number of losses under several classes of insurance. The main type of reinsurance available to protect an insurer against such events is catastrophe excess of loss cover whereby if the ceding company's aggregate retained losses arising from one event exceed a specified sum, the reinsurer is liable for the balance subject to an upper limit. Excess of loss reinsurances arranged to cover an accumulation of losses affecting more than one class of insurance are known as umbrella covers.

As is the case with other excess of loss reinsurances, an insurer considering catastrophe excess of loss cover must decide on both his retention limit and the amount of reinsurance cover required. The latter factor, although as important as the retention limit in relation to both the protection afforded and the cost of the reinsurance, is beyond the scope of this study. Regarding the fixing of retention limits, there is no simple universal rule. However there is some measure of agreement between reinsurance authorities as to the relationship between per risk and catastrophe retention limits.

Buhlmann (1964, p.,43) has pointed out that in practice it

is considered adequate for the catastrophe retention limit to be between two to four times the highest retention limit per risk. Other writers (e.g. Rubin, 1980, p.101), (Thorne, 1984, p.171) and (Tickell, 1980, p.321) have suggested that twice or a little more than the insurer's retention level for any one risk is the appropriate figure.

Although retention limits under catastrophe covers of not less than two times the per risk retention seem to be the general rule, retentions usually differ between classes of insurance. For example, Gerathewohl (1980, pp. 154-5) says that for catastrophe reinsurances covering motor insurance portfolios the retention limit for damage to vehicles by natural hazards is rarely less than five to ten times the value of a medium-size car, even in the case of small insurers. On the other hand, in marine insurance where the risk of accumulations is substantial, the retentions under catastrophe covers are generally only slightly higher than the retention per risk.

Clearly, one loss event affecting several classes of insurance may have a greater impact on an insurer's annual results than an accumulation loss involving one class only . Therefore, catastrophe retentions should be fixed at a point sufficient to protect the insurer against losses which may occur in several classes of insurance unless, as discussed in Section 9.5.2 of chapter nine, the insurer also arranges an umbrella reinsurance to cover that contingency. Regarding such reinsurances, Gerathewohl (1980, p. 155) is of the opinion that there can be no general guidelines for setting retention limits which cater for all or at least several classes. He

says an appropriate figure will depend on four factors (i) the insurer's capital and free reserves; (ii) his premium income; (iii) the probability of one loss event affecting several classes of business at the same time; and (iv) the scope of the separate types of reinsurance treaties already arranged for individual classes of insurance to prevent accumulations of retained losses.

11.5 Types of Reinsurance Suitable for Different Classes of Insurance

It is difficult to generalise on the matter of whether it is better to protect a certain class of business under non-proportional or proportional treaties. The characteristics of each class of insurance and the particular insurer's business, as well as reinsurance costs, will influence the insurer's choice as to the type of reinsurance he will purchase. To some extent that choice will be constrained by the class of insurance concerned and the nature of the different forms of reinsurance, as will now be explained.

According to Kiln (1981, p. 41), the use of quota share reinsurance generally prevails in the classes of insurance where the definition of one loss or a single risk is impossible. Obvious examples are hail, disease (such as foot and mouth in cattle) and medical insurances. Brown and Reed (1981, p.46) explain that quota share reinsurance frequently is used for marine cargo accounts, because it gives the insurer the protection he needs to increase his capacity . Marine cargo business is often susceptible to accumu-

lations of losses from one event which derive from many small and medium sized losses. Therefore, a quota share reinsurance would enable the insurer to recover a part of every loss that is incurred.

Conditions, however, may change over time. Carter (1979, p.386) cited the change that has occurred in reinsurers' attitudes to the use of quota share treaties by new motor insurers, which was common practice in the 1960s. Now reinsurers are reluctant to provide such cover unless the insurer is prepared to fix a high level of retention for his own account. Also it was widely reported that during the 1984 London market renewal season because of the high losses incurred by reinsurers on proportional business, many insurers were unable to renew their proportional reinsurance treaties and reluctantly had to switch to excess of loss covers. So in choosing the form of reinsurance to be employed it is not just a matter of what the insurer would like, but also what reinsurers are prepared to supply and the price they want for it.

Like a quota share reinsurance, stop loss covers are mostly used for classes of business where great problems could arise as regards the definition of ' any one event' or 'any one risk', but they are considered most suitable for classes like crop insurance against hail which in addition are subject to considerable fluctuations in underwriting results caused by differences in claims frequency. Stop loss covers may be used to protect a whole account, either in lieu of, or to supplement other forms of reinsurance.(1)

(1) "In the past years there have been many stop loss covers effected on marine accounts, particularly for Lloyd's underwriters. However, following the very unfavourable results in this branch, almost all have disappeared and a cover is only obtainable in respect of a very high deductibles, i.e. stop loss cover in the form of a catastrophe protection". '(Policy, 1970, p.328).

Surplus reinsurance is suitable only for those classes of insurance where the maximum liability of the insurer for each individual risk is known such as fire, theft and personal accident insurances. It cannot be used for classes of insurance that do not meet that condition, such as liability insurances, including in particular motor and workmen's compensation insurances which often are subject to unlimited liability. (I.I.L. 1951, p.88). Indeed, the special suitability of surplus reinsurance to property insurances makes it the most extensively used type of reinsurance for fire business.

Excess of loss reinsurances are increasingly being used in lieu of, or in conjunction, with proportional (i.e. quota share and surplus) reinsurances to provide protection against large individual losses in connection with most classes of non-life insurance. However, their main use is still for all types of liability insurance for which, as noted above, surplus reinsurance cannot be used. The attractions to direct insurers of excess of loss reinsurance treaties are the ease of administration and so low administrative costs, and the savings in premiums ceded. However Carter (1979, p.404) maintains that they are not suitable as working covers for:

"(i) portfolios which are too small to provide the reinsurer with an adequate premium and reasonably stable loss experience; or

(ii) new companies and companies commencing writing new classes of business, particularly specialist companies, who therefore do not possess a proven underwriting record; or

(iii) certain types of specialist classes of business (e.g. performance guarantees)".

Also as excess of loss reinsurances are not suitable for reciprocal exchanges of business, a fire insurer who is seeking reciprocity might choose to employ a combined quota share and excess of loss treaty, using the premiums ceded on the former to obtain a reciprocal exchange.

Finally, catastrophe excess of loss treaties are used to protect multiple losses arising outof a single event. In cases where multiple involvement of the insurer's various retentions in one class of insurance or different classes of insurance are exposed to a catastrophic event, he should affect a catastrophe cover to protect the whole of his net retained account.

11.6 Formulating a Reinsurance Programme

As already explained, the determination of a sound reinsurance programme is important to an insurance company for various reasons, not least being financial stability, profitability and the size of its retained premium income. So far the factors to be considered in choosing the form(s) of reinsurance to be employed and the retention limit(s) have been discussed mainly from the standpoint of the ceding company but the reinsurer's interests must be allowed for too. For example, besides the ceding company's loss experience on its gross and net retained accounts, the reinsurer's past and potential future claims experience on the business ceded must be taken into account too. Sometimes although the ceding company's

experience on its retained account may have been profitable, the reinsurer may have incurred a loss on the business ceded. If this should occur with a surplus treaty, the reinsurers may reduce the rate of reinsurance commission and/or profit commission in order to increase their treaty income at the expense of the ceding company's net retained income. Alternatively, if the problem arose from the treaty being badly unbalanced (i.e., the reinsurers' maximum claims liability greatly exceeded the treaty premium income) the reinsurers, depending on the risk profile of the reinsured account, may either ask the ceding company to accept lower retention limits, or more likely reduce the treaty limit. The latter course would force the ceding company to reduce its own acceptance limits or for cases with sums insured exceeding the treaty limit, buy facultative reinsurance which would carry a lower rate of reinsurance commission. In the case of quota share reinsurances the ceding company and the reinsurer participate proportionately in any change in the claims experience. The danger arises when (i) the ceding company retains only a very small proportion of the business written, and (ii) the reinsurance commission is at a rate sufficiently higher than the cedant's own expense ratio to almost eliminate any risk of the company incurring an underwriting loss on its retained account. In such circumstances a low retention limit may encourage the company not to care about the quality of the business accepted. Therefore, the reinsurer may ask for a higher level of retention in order to oblige the ceding company to improve its underwriting standards and, ultimately, its business results.

To summarise what has been said in this chapter so far, the

management of an insurance company in deciding on its reinsurance programme must choose:

(i) the forms of reinsurance to employ; and

(ii) the retention limits for each class of business and reinsurance treaty.

Those decisions will involve consideration of all of the various factors discussed in this and the preceding two chapters.

In addition, it will also need to decide how often it will review its reinsurance programme, including its retention limits. Possibly it may need to modify its retention limits every year in the light of its financial strength, premium growth, loss experience, etc.

Two Arab companies supplied details of their existing reinsurance programmes, and the following two examples show how restructuring of those programmes could help the companies to increase their retained premium incomes.(1)

Example 1, Company A

In 1980 the company protected its fire account by a combination of quota share and surplus reinsurance treaties. The quota share provided 80 per cent reinsurance for any one risk up to $ 800,000 i.e. the company had a retention limit of $ 160,000. A first surplus treaty then provided automatic cover for up to 10 lines based on a gross line of $ 800,000, i.e. $ 8,000,000, and a second surplus of

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(1) Figures were provided by the two companies subject to the non-disclosure of their names. Therefore as an aid to confidentiality monetary values have been converted into US dollars.

14 lines (i.e. $ 11,200,000). Thus, the company had a total acceptance limit of $ 20,000,000 any one risk. It retained $ 1.1 million of its gross premium income of $ 12 million, with the quota share reinsurers receiving $ 4.4 million, and the balance of $ 6.5 million being ceded to the first and second surplus treaties.

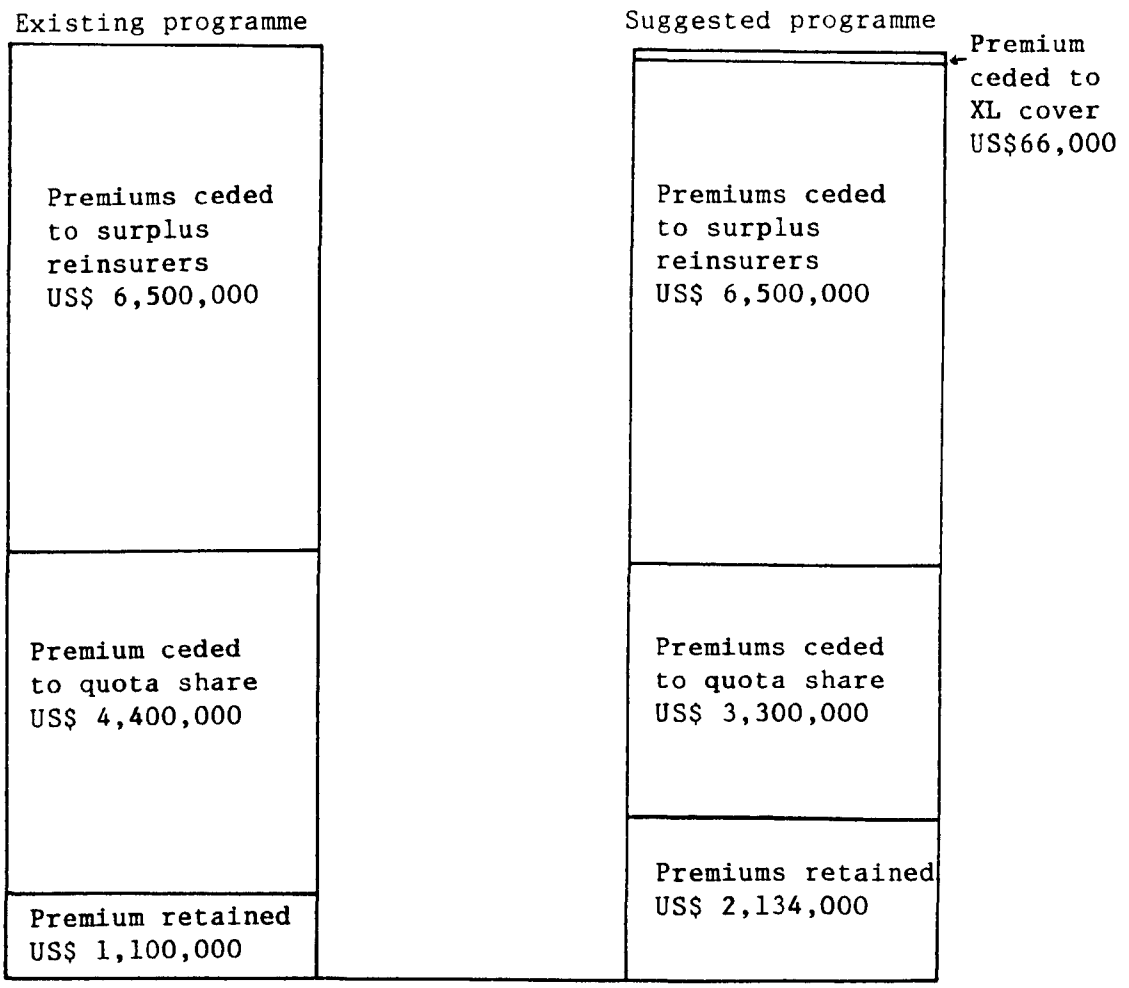
The Suggested Programme

The simplest way for the company to increase its retained premium income would be for it to raise its retention limit. So, for example, if it doubled its quota share retention from 20 to 40 per cent of the treaty limit of $ 800,000 for any one risk (i.e. from $ 160,000 to $ 320,000), the premium income of $ 5.5 million shared with the quota share reinsurers would be redistributed to give the company a retained premium income of $ 2,200,000 and reduce the premiums ceded to $ 3,300,000. On the basis of its claims experience for the years 1977 to 1979 inclusive, the company estimated that it would be able to buy a per risk excess of loss reinsurance cover of $ 160,000 excess of $ 160,000, to reduce its net exposure on any one risk to the original level, at a premium rate of 3 per cent on its gross net premium income. Thus the cost of the excess of loss cover would be $ 66,000, so that the total premiums ceded to reinsurers would be reduced by $ 1,034,000, leaving the company with a retained premium income of £2,134,000. Figure 11.2 shows the distribution of premiums in the existing and suggested programmes.

The company would, of course, be retaining a higher proportion of its potential gross claims costs and a larger risk of fluct-

Figure 11.2

Distribution of Gross Premium Income of US$ 12 million



uations in its retained claims costs. Moreover the saving in the net cost of its reinsurance would be less than $ 1,034,000, even if it proved possible to obtain the excess of loss reinsurance at the anticipated terms because:

(a) the above figures make no allowance for the reinsurance commission, and possibly profit commission too, deductible from the quota share premiums; and

(b) the company would enjoy the benefit of longer delays in paying reinsurance premiums to its quota share reinsurers than to an excess of loss reinsurer, with the resulting effect on its investment earnings.

Unfortunately the company was not willing to provide the details required to permit the estimation of the net saving in the reinsurance costs. However, even on the basis of, say, a 30 per cent reinsurance commission payable on the quota share treaty, against the premium saving of $ 1,034,000 would need to be offset a loss of reinsurance commission of $ 330,000. That, however, would still leave the company with a substantial saving from which to meet any increase in its retained claims costs.

Example 2 : Company B

This case relates to a marine cargo insurance account of a company which is required to cede a fixed proportion of every risk it writes to the state reinsurance corporation under a compulsory quota share treaty : to preserve anonymity the proportion so reinsured will be assumed to be 20 per cent. The company then made the following reinsurance arrangements for the remaining 80 per cent of its

business : all of the figures that follow relate only to that part of its total gross business accepted.

	Treaty limits based on 80% of sums insured (i.e. net of 20% compulsory quota share)	
	1976 and 1977	1978 to 1980
	$	$
50% Quota share treaty (nominal)	300,000	750,000
Surplus treaty	4,200,000	3,750,000
	(= 14 'gross net' lines)	(= 5 'gross net' lines)
Excess of loss for common account of ceding company and quota share reinsurers	2,000,000 excess of 300,000	4,500,000 excess of 750,000

The company's total acceptance limits, therefore, would have been:

1976 and 1977 - \$6.5 million x $\frac{100}{80}$ = \$8,125,000

of which compulsory quota share = \$1,625,000

1978 to 1980 - \$9.0 million x $\frac{100}{80}$ = \$11,250,000

of which compulsory quota share = \$2,250,000

Its retention limits any one risk were \$150,000 in 1976, rising to \$375,000 in 1978.

Therefore if in 1976 the company had incurred a loss on a case with a sum insured equal to its total acceptance limit, the loss would have been distributed as follows:

	Loss $4,062,500		Loss $8,125,000	
		$		$
Recovery from compulsory quota share		812,500		1,625,000
Balance (divided as follows)		3,250,000		6,500,000
Ceding company	575,000		1,150,000	
less recovery from excess of loss cover	425,000	150,000	1,000,000	150,000
Quota share reinsurers	575,000		1,150,000	
less recovery from excess of loss cover	425,000	150,000	1,000,000	150,000
Surplus reinsurers		2,100,000		4,200,000
Excess of loss reinsurers		850,000		2,000,000

After deducting the claims incurred and the company's expenses, the total underwriting profit on the gross net (80%) account for the period 1976-1980 amounted to approximately 10 per cent of the total gross net premium income of $107,087,457. The results of the business ceded by the company to its voluntary treaty reinsurers were as follows:

	Reinsurance premiums	Reinsurance & profit commissions paid by Reinsurers	Claims incurred by Reinsurers	Underwriting Results for Reinsurers	As % of reinsurance premium
	$	$	$	$	
50% quota share	39,930,923	18,282,001	19,142,404	2,506,518	6.28
Surplus treaty	25,660,559	12,618,545	8,602,341	4,439,673	17.30
Excess of loss treaty (company's share only)	782,526	-	483,242	299,284	38.25
	66,374,008	30,900,546	28,227,987	7,245,475	10.92

Note: the figures shown for the excess of loss treaty are for only a half of the amounts received and paid by that reinsurer.

The above figures include the voluntary reinsurances share of all claims incurred on the portfolio. During the period there were only a small number of claims that exceeded the company's retention limits. The annual gross net costs of those claims and their pure burning costs relative to the company's gross net premium were as follows:

Year	Gross net premium income	Large claims exceeding the company's retention limit		Pure burning cost
	$	No. of claims	Annual gross cost $	
1976	11,809,526	1	354,828	3.00
1977	11,868,483	1	388,594	3.27
1978	14,840,815	1	238,545	1.61
1979	28,869,253	5	3,037,431	10.52
1980	39,699,380	3	2,577,560	6.49
	107,087,457	13	6,596,958	6.16

The company had no choice regarding the continuation of the compulsory quota share reinsurance but it could have considered replacing all of its voluntary treaties byaworking excess of loss cover for:

1976 and 1977 $6,350,000 excess of $150,000

1978 onward $8,625,000 excess of $375,000

It is only possible to speculate as to the premium an excess of loss reinsurer would have required, particularly because:

(i) the reinsurer might have calculated the premium rate on three or five years burning costs, but the company's loss experience prior to 1976 was not made available;

(ii) the burning costs are subject to both substantial fluctuations and a deteriorating trend; and

(iii) the reinsurer in calculating the burning cost might have adjusted it for inflation which rose from an annual rate of 7 per cent in 1976 and 1977 to an average 10 per cent in the next three years.

The last point presents the least difficulty because both marine cargo sums insured and claims costs are equally affected by rising prices, unlike liability and marine hull insurances where long delays in the settlement of claims disproportionately affect claims costs. Therefore any attempt by the reinsurer to adjust the burning costs for inflation would have had only a minor affect on the figures shown above.

More problematic is the reinsurer's possible responses to (i) and (ii), including the size of premium loading and annual premium

adjustment limits that would have been required. If, for example, the reinsurer had:

(i) rated the risk on a year of account basis;

(ii) used a fairly conventional loading factor of $\frac{100}{75}$ applied to the above pure burning costs; and

(iii) set the annual adjustment limits for the loaded burning rate at 4-11 per cent of the ceding company's gross net premium income;

the total reinsurance premium for the period would have been as follows:

Year	Loaded burning cost	Rate applied to GPNI	Reinsurance Premium $
	%	%	
1976	4.00	4.00	472,381
1977	4.36	4.36	517,466
1978	2.15	4.00	593,633
1979	14.03	11.00	3,175,618
1980	8.65	8.65	3,433,996
			8,193,094

As can be seen from the following accounts, under the reinsurance arrangements in force during the period the company would have retained for its own account less than 40 per cent of its gross premium income net of the compulsory quota share cessions, and earned an underwriting profit of $4,971,587. By changing over to an excess of loss treaty on the terms suggested above, the company would have more than doubled both its retained premium income and underwriting profit.

Estimated Aggregate Underwriting Results 1976-1980

	Reinsurance arrangements in force $	Suggested excess of loss cover $
Gross Net Premium Income	107,087,457	107,087,457
Less Reinsurance Premiums Ceded	66,374,008	8,193,094
Retained Premium Income	40,713,445	98,894,363
Plus Reinsurance Commissions	30,900,546	-
	71,613,791	98,894,363
Less Retained Claims	19,142,404	40,773,433
	52,471,587	58,120,930
Less (estimated) Expenses	47,500,000	47,500,000
Underwriting Profit	4,971,587	10,620,930
Underwriting Profit as a percentage of gross net premium income.	12.21%	10.74%

One might conclude from the above that the suggested excess of loss reinsurance programme would have proved more beneficial to the company, despite the reduction in the underwriting profit relative to the retained premium income (though no allowance has been made for a possible reduction in the costs of administering non-proportional treaties). However, in practice sole reliance on excess of loss reinsurance may not have proved entirely satisfactory for four reasons:

(1) The impact on the company's solvency margin of a substantial increase in retained premium income would have to be considered.

(2) The reinsurer's potential claims liability would have been large in relation to the treaty premium income, and the annual

claims experience might be subject to substantial fluctuations. Allowance would have needed to have been made for both factors in the size of the premium loading and the premium adjustment limits. The former would increase the ceding company's reinsurance costs whereas wide adjustment limits would leave the company exposed to substantial variations in those costs from year to year.

(3) An excess of loss reinsurance would have provided no protection against the fluctuations in the number of small losses which are inherent in the all-risks cover provided by marine insurance. Unfortunately the company did not supply details of its aggregate annual claims experience.

(4) As noted previously, the effect of the changeover to excess of loss reinsurance on the company's investment earnings would also need to be brought into account.

Although the reinsurance programmes suggested in the above two examples may not be ideal, they at least demonstrate that if an insurance company studies its reinsurance programme carefully it may prove possible to increase its retained premium income and decrease its net reinsurance costs. Any analysis of an existing reinsurance programme may provide different solutions from which to choose the best type(s) of reinsurance. In practice, this is not an easy matter, because of the many factors involved but all reinsurance programmes should be subject to periodic review and revision in the light of changes in a company's position.

11.7 Conclusions

The fundamental difference between quota share and stop loss reinsurances on the one hand, and surplus and per risk excess of loss reinsurances on the other is that whilst the former are based on all risks within a portfolio, the latter are based on individual risks. Quota share and stop loss will provide protection against small and medium sized losses, whilst surplus and per risk excess of loss reinsurances mainly afford protection against individual large losses.

As such, each type of reinsurance will provide protection for a specific claims structure, and thus the level of retention to be determined will differ in each case. One might ask whether one particular form of reinsurance for a specific class of business would provide better reinsurance protection than another form. It is difficult to find an alternative type of reinsurance which provides a wholly satisfactory substitute one for on other. To replace on reinsurance treaty by another is not always the best solution for improving a company's net operating result, particularly for small companies, and furthermore there could be specific disadvantages in any such replacement.

Nevertheless, over the years an insurance company should pay out less actual absolute profit to non-proportional reinsurers than would be paid (after commission) to proportional reinsurers. Therefore the choice of a particular form of reinsurance should be made after careful study of the structure and characteristics of the insurance class in question, and it may be that those Arab companies

which rely on only proportional reinsurance for the protection of individual classes of insurance could beneficially employ a combination of proportional and working excess of loss treaties.

CHAPTER TWELVE

APPLICATION OF RETENTION LIMITS AND THEIR RELATIONSHIP WITH RETAINED PREMIUM INCOME AND FREE CAPITAL - THE EMPIRICAL EVIDENCE

12.1 Introduction

As demonstrated in the preceding chapters, many varying and interrelated factors enter into the determination of retention limits, and as an insurer's circumstances change, so periodically its retention limit(s) should be readjusted accordingly. Yet whether insurers behave in that manner in practice is largely a matter of speculation, as little empirical research appears to have been conducted on the subject.

In order to obtain data on the subject of retention limits, the questionnaire on corporate objectives which, as noted in Chapter ten, was sent to 143 Arab insurance and reinsurance companies, and to which 46 replied,[1], included three questions dealing with the fixing of retention limits. Therefore the purpose of this chapter is:

(a) to present an analysis of the replies to those questions;

(b) to analyse and compare the relationship between retention limits on the one hand and retained premium income and capital/free reserves on the other in fire, marine and motor business for two Arab direct insurance companies; and

(c) to see whether the questionnaire findings of these two Arab companies are consistent with the data analysis in (b).

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(1) See Table 10.2 for the analysis of respondents by type of company, and the appendix to Chapter 10 for a copy of the questionnaire.

12.2 Retention Limits in Practice

The questionnaire sought to discover more about the practice of Arab insurance and reinsurance companies in regards to the fixing of retention limits. It was kept as short as possible in order to try to obtain a good response, and therefore concentrated on three matters which reinsurance theory indicates to be of key importance in the formulation of optimum reinsurance programmes.

First, the companies were asked (question 5) whether in fixing their retention limits they pay regard to (i) their capital and free reserves, and/or (ii) their net retained premium incomes. Summaries of the answers from the 46 respondents given in table 12.1 and 12.2 confirm the importance assigned to those two factors in practice. It can be seen that almost three-quarters of the companies relate retentions to their capital and free reserves, almost half take into account retained premium incomes, and almost one-third consider both factors. Only a tenth of the companies pay no regard to either factor.

Secondly,in question 6 the companies were asked to state which of five factors listed they considered most important when they last fixed their retention limits: they were also invited to add others. The most significant findings are:

(1) that most companies ranked maintaining financial strength and increasing retained premium income as their first two considerations, but the importance attached to the other factors varied by type of company.

Table 12.1

The Proportion of Companies that pay regard to (i) Capital and Free Reserves and (ii) Net Retained Premium Income in Fixing Retention Limits

Type of Ownership	Capital/Free Reserves				Net Retained Premium				No.of Respondents	% of total
	Yes	%	No	%	Yes	%	No	%		
State	8	89	1	11	4	44	5	56	9	20
Private	10	71	4	29	6	43	8	57	14	30
Mixed	3	50	3	50	3	50	3	50	6	13
Co-operative	2	100	-	-	-	-	2	100	2	5
Foreign subsidiary	1	100	-	-	-	-	1	100	1	2
Owned by Local and foreign interests	9	64	5	36	9	64	5	36	14	30
Total	33	72	13	28	22	48	24	52	46	100

Table 12.2

The Proportion of Companies that Pay Regard to (i) Capital and Free Reserves and (ii) Net Retained Premium Income in Fixing Retention Limits

Factors considered	No. of respondents	%
a. Capital and free reserves only	19	41
b. Net retained premium income only	8	17
c. Both (a) and (b)	14	31
d. Neither capital/free reserves nor net retained premium income	5	11
Total	46	100

(2) 'expansion of gross premium income' was ranked third by state, private and mixed companies.

(3) although Arab companies are much concerned about reinsurance costs, some companies when fixing their retention limits ranked this factor in the third place and others in the fourth.

Table 12.3 and figure 12.1 show the type of companies and the importance attached to each of the five listed factors in fixing their retention limits.Four companies also added another factor to the list but as no indication was given as to its importance one may assume that it was of minor significance. The additional factors were:

- to improve the financial strength of the company.
- to increase the profitability of the company.
- to limit claims costs.
- to base business growth on the company's financial strength.

The final question was designed to find out how often companies revise their retention limits. As shown in Table 12.4, 69 per cent of the companies said that they undertake an annual revision of their retentions. Possibly however, some of the companies meant that their retention limits are merely reviewed(and not necessarily changed) when reinsurance treaties are due for renewal each year.

12.3 The Relationship of Retention Limits to Retained Premium Income and Capital/Free Reserves in Two Arab Insurance Companies

The empirical studies of the two Arab insurance companies examined in this chapter represent two different insurance market

TABLE 12.3

The Importance attached by Arab insurers to various factors in determining Retention Limits(1)

Factors	State		Private		Mixed		Co-operative		Foreign Sub.		Local & Foreign		Total	
	Total points	Degree of imp-	Total points	Degree of imp-	Total points	Degree of imp-	Total points	Degree of imp-	Total points	Degree of imp-	Total points	Degree of imp-	Total points	Degree of imp-
a. Maintain financial strength	42	1	64	1	23	1	10	1	4	2	61	1	204	1
b. Premium growth	23	3	40	3	11	3	9	2	2	4	31	4	116	3
c. Increase retained premium	31	2	50	2	20	2	9	2	5	1	51	2	166	2
d. Limit retained premium	10	4	25	4	7	4	2	4	-	-	7	5	51	5
e. Minimise reinsurance cost	23	3	25	4	20	2	4	3	3	3	33	3	108	4
	129		204		81		34		14		183		645	

(1) The method of calculating the total points for the purpose of determining the importance of the factors was the same method as for Table 10.5 of Chapter 10.

Figure 12.1

The Importance of some Factors in Determining of the Retention limits

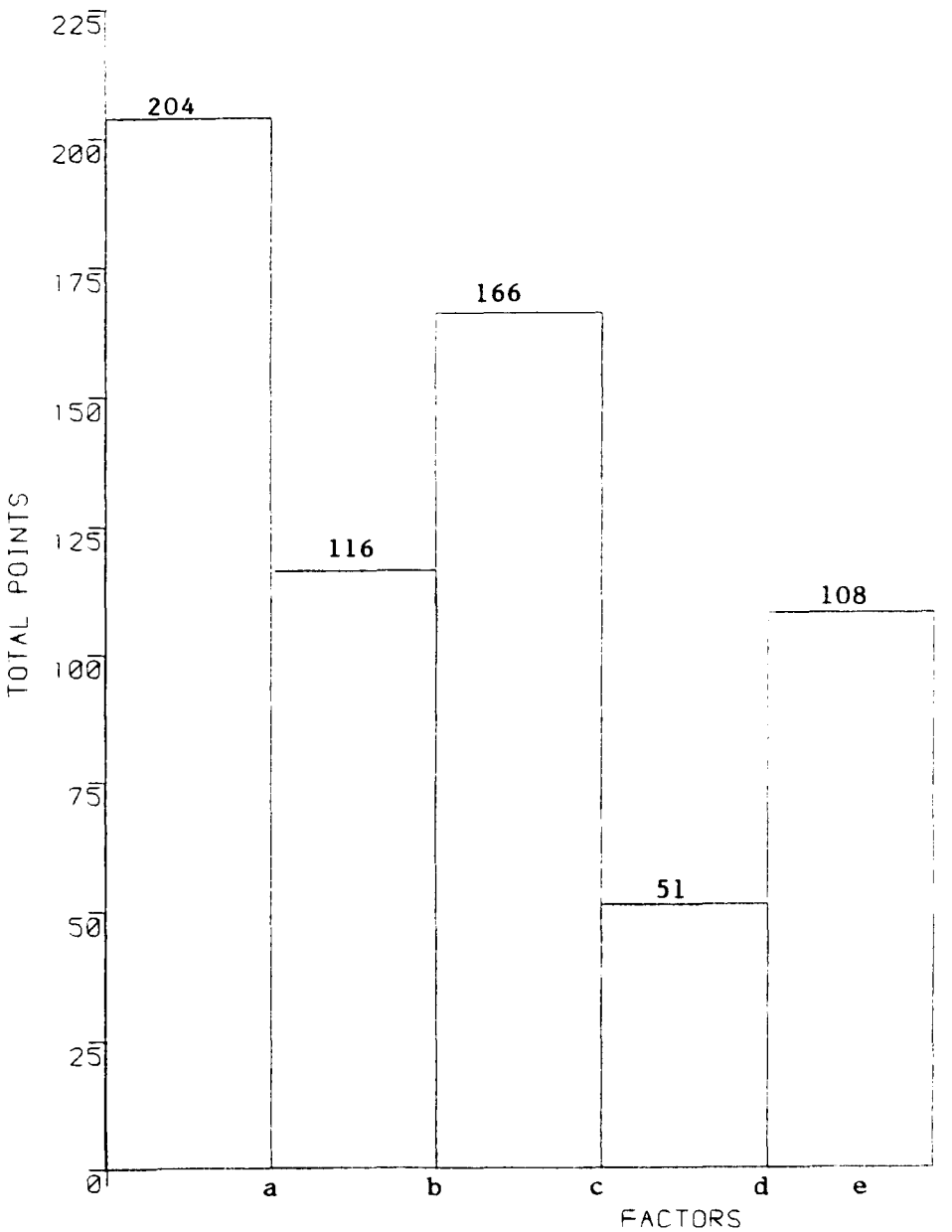


TABLE 12.4

Time Intervals for the Revision of Retention Limits

Type of Ownership	Annually		Two Years		Three Years		Four Years		More than four years	
	No.	%	No.	%	No.	%	No.	%	No.	%
State	6	67	1	11	1	11	-	-	1	11
Private	10	72	-	-	2	14	1	17	1	17
Mixed	4	66	1	17	1	17	-	-	-	-
Co-operative	1	50	-	-	1	50	-	-	-	-
Foreign Subsidiary	1	100	-	-	-	-	-	-	-	-
Owned by Local and Foreign Interests	9	64	-	-	4	29	-	-	-	-
Total	31	69	2	4	9	20	1	2	2	4

Note: Only one company did not mention how often its retention limits were raised.

structures: a free market with company A, and a monopoly market with insurance company B.(1) Company B, a government owned insurer, has been operating for over thirty years and is the sole non-life insurer in its country. Company A, founded around ten years ago and owned by local and foreign interests, operates in a market alongside a large number of insurance companies. Both companies conduct their business in an expanding economy. Also both companies are among the largest in the Arab World in terms of volume of premium income. The gross premium income of company A has grown at an average annual rate of 52.2 per cent from 19.9 million monetary units in 1974 to 247.7 million in 1980. Company B's premium growth over ten years was 36.1 per cent from 7.5 million in 1971 to 120.5 million in 1980. Both companies have achieved a considerable underwriting profit on their overall business.

Although a case could be made for an insurance company to fix common retention limits for all classes of insurances it writes, it is the normal practice for insurers to treat each class separately and to apply different retentions according to the nature and size of each account. Therefore, the two companies were asked for details of their reinsurance programmes for each of the main classes of insurance transacted for at least seven years.

In order to evaluate the reinsurance policies pursued by the companies in regards to the sizes of their retention limits relative to (i) retained premium income and (ii) their capital and free reserves, the retention limits for each class of insurance will be comp-

(1) Information was provided by the two companies subject to the non-disclosure of their names, therefore, they will be referred to as (A) and (B). As an aid to confidentiality no currency units will be named.

ared with the 'rules of thumb' discussed in Chapter 9, that is:

Type of Relationship	Small companies	Large companies
Retention Limit (per risk) / Retained premium income	Up to 10%	Around 1%
Retention Limit (per risk) / Capital and free reserves	Up to 5%	Not more than 1%

The status of the two companies was discussed with several reinsurance officials who were of the unanimous opinion that company A falls into the 'small company' category whereas company B by the end of the 1970s had reached medium size.

12.3.1 Relationship Between Retention Limits Per Risk and Retained Premium Income

12.3.1.1. Fire Business

Both companies have excess of loss treaties to protect themselves against accumulations of losses from one event. Only in the case of company A however, is the excess of loss cover structured in a way that it also incorporates a working layer to reduce A's potential net retained loss for any one risk after allowing for claims recoveries from the underlying proportional reinsurance treaties. Unfortunately it was not possible to obtain details of the deductible on that excess of loss cover.

Company A

Table 12.5 shows the development of the company's gross premium income (GPI), retained premium income (RPI) and retention limits

(RLs) of its fire 1st, 2nd surplus and facultative obligatory treaties; as noted above the company's maximum retained loss is further reduced by an excess of loss treaty which being of an unknown amount is ignored in the following analysis. The company has achieved a high rate of growth of GPI which has been accompanied by a higher rate of growth of RPI. GPI increased thirty-two fold during the period 1974-80, with an average annual growth rate of 78.3 per cent for these years. In comparison, the company has increased its RPI almost fifty-one fold and achieved an average annual growth rate of 92.3 per cent for the same period. Although the RPI has increased faster than the GPI during the period under analysis, the retained proportion of the premium income remained very small: excluding 1973 it averaged 3.71 per cent and ranged between 2.4 per cent and 5.2 per cent.

During the period 1973-80, out of a total of 93.046 million gross premiums written, only 3.358 million (3.6 per cent) was retained, with the balance of 89.688 million (96.4 per cent) being passed to reinsurers.

Table 12.5 also shows that the company only revised its retention limit once during the period, doubling it in 1977. During the whole period the maximum limit any one loss as a percentage of RPI was extremely high and by 1980 it had only dropped to 47.1 per cent (see figure 12.2), though possibly its excess of loss cover would have brought that limit down to a much lower figure. The company, however, may have been prepared to have run a higher than normal risk during its early years when it was trying to build-up its

Table 12.5

Development of Gross Premiums, Retained Premium Income, and Retention Limits of Fire 1st, 2nd Surplus and Fac/Oblig. Treaties - Company A
(000's omitted)

Year	GPI	RPI	$\frac{RPI}{GPI} \times 100$	RLs	$\frac{RL}{RPI} \times 100$
1973 (6 months)	135	9	6.7	250	2778.0
1974	892	21	2.4	250	1190.5
1975	1,691	69	4.1	250	362.3
1976	4,011	209	5.2	250	119.6
1977	10,278	395	3.8	500	126.6
1978	22,256	698	3.1	500	71.6
1979	25,111	895	3.7	500	55.9
1980	28,672	1,062	3.7	500	47.1

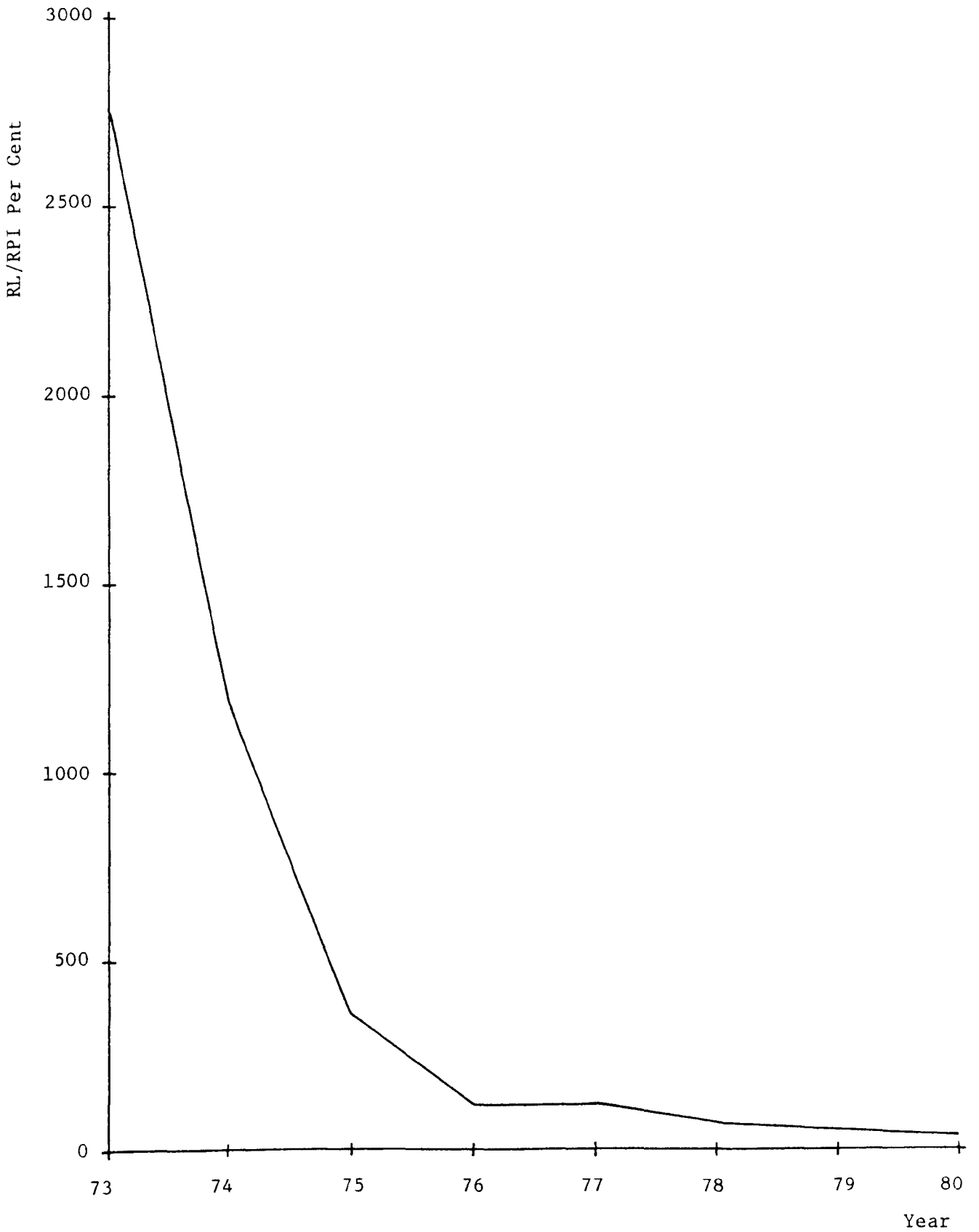
business, particularly as most of the market's fire premium income comes from large risks. Moreover, as will be seen later, the company was well capitalised.

Company B

The comparable details for this company are shown in Table 12.6. Its GPI has increased almost ten times (an average annual compound rate of growth of 29.1 per cent) for the period 1971-80, which compares with an approximately nine fold increase in its RPI (an average annual growth rate of 27.8 per cent). The percentage of RPI to the GPI has varied between 31.1 per cent (1975) and 22.4 per cent (1979). Since 1975 an increasingly higher share of the

Figure 12.2

Retention Limit as a Percentage of Retained Premium Income for Fire 1st, 2nd Surplus and Fac/Oblig. Treaties - Company A



company's growing GPI was ceded to reinsurers, including a large share ceded to the local reinsurance company.(1) During the period 1971-80, out of a total GPI of 50.749 million, the company was able to retain 12.908 million (i.e. 25.4 per cent).

Table 12.6

Development of Gross Premiums, Retained Premium Income, and Retention Limits of Fire Quota Share and 1st, 2nd, 3rd Surplus Treaties - Company B
(000's omitted)

Year	GPI	RPI	$\frac{RPI}{GPI} \times 100$	RLs	$\frac{RL}{RPI} \times 100$
1971	1,281	329	25.7	40	12.2
1972	1,484	400	27.0	40	10.0
1973	1,842	448	24.3	40	8.9
1974	2,363	564	23.9	40	11.3
1975	3,074	956	31.1	75	7.8
1976	4,206	1,260	30.0	75	6.0
1977	6,378	1,763	27.6	75	4.3
1978	7,168	1,907	26.6	75	3.9
1979	10,207	2,286	22.4	75	3.3
1980	12,746	2,995	23.5	75	2.5

Table 12.6 also shows that, like company A, company B has only increased the retention limit of its fire quota share and surplus treaties once over the period - from 40,000 to 75,000 in 1975.

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(1) Company (B) is ceding to the local reinsurance company more than 20% as a legal cession, and a very high proportion of its voluntary reinsurance treaties.

The percentage of RL to RPI has dropped from 12.2 per cent in 1971 to 2.5 per cent in 1980. Apart from 1971, 1972, 1973 and 1974 this percentage was within the 'rule of thumb' guidelines (see Figure 12.3). Obviously the decline in these percentages resulted from the continuous increase in the company's RPI on the one hand, and the stabilisation of its RL during the period 1975-80 on the other. The willingness to allow such a relative decline in its RL may be due to the company having to underwrite the whole fire business of a market in which, in recent years, there has been a considerable increase in the number and size of very large risks. Therefore the company may prefer to follow a conservative policy in determining its fire RL.

12.3.1.2 Marine Cargo Business

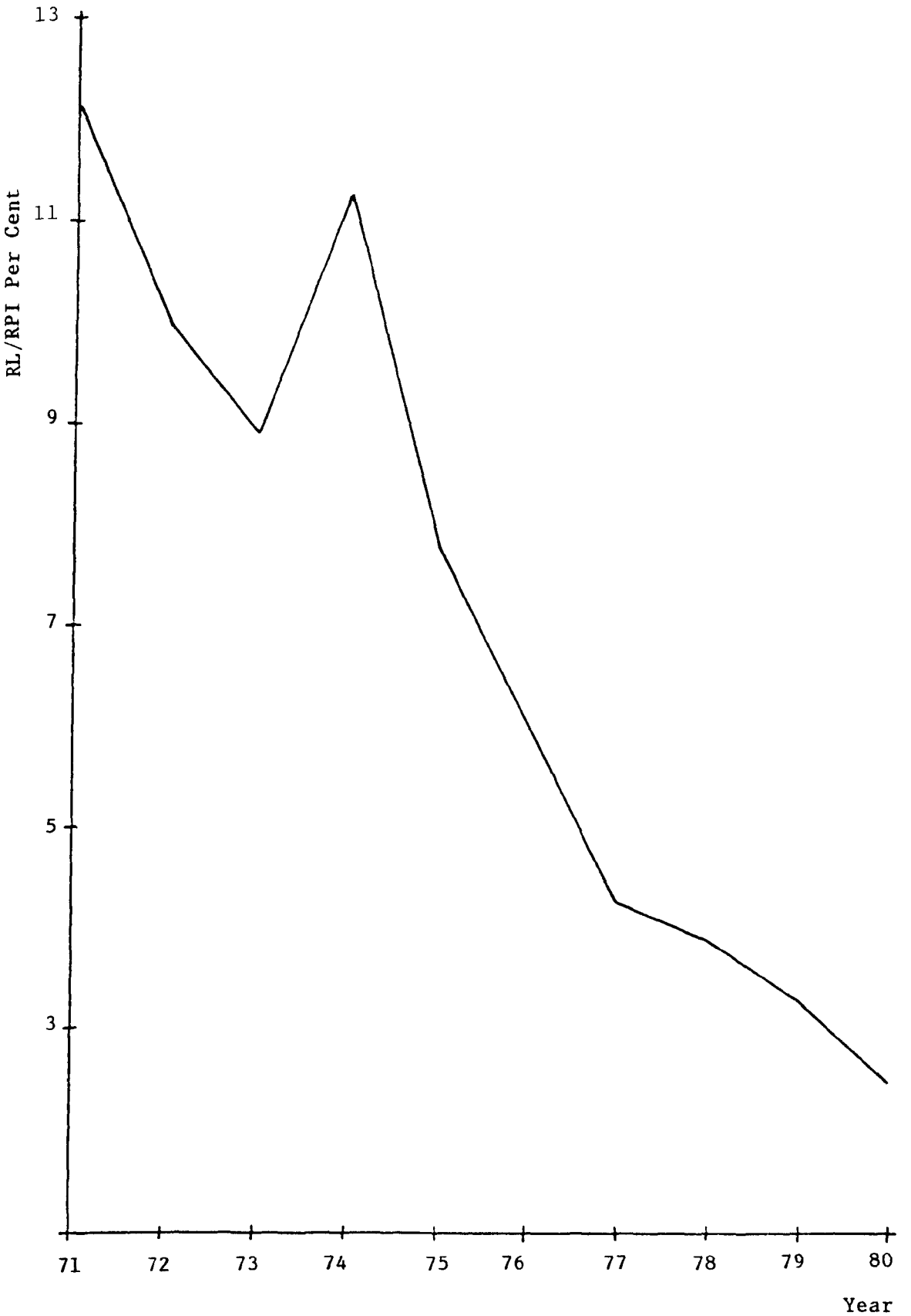
Company A

Table 12.7 shows that during the period 1974-80 the GPI increased almost seven-fold, and the RPI thirty-four fold. Despite such a rapid increase in RPI, the volume of reinsurance premiums paid to reinsurers was very large; during the years1973-80 the company ceded 105.696 million (i.e. 92.0 per cent) out of a total GPI of 114.849 million.

Despite the retention limit having been increased twice the company was able to retain only a small, though over the period increasing, proportion of its gross premium income. Figure 12.4 shows the rapid decline in the company's RL as a percentage to RPI from 131.6 per cent in 1973 to 4.5 per cent in 1980, which is well

Figure 12.3

Retention Limit as a Percentage of Retained Premium Income for Fire Quota Share and 1st, 2nd and 3rd Surplus Treaties - Company B



below the 'rule of thumb' guideline of up to 10 per cent for a small company.

Table 12.7

Development of Gross Premiums, Retained Premium Income, and Retention Limits of Marine Cargo, 1st, 2nd, 3rd, Surplus and Quota Share Treaties - Company A (000's omitted)

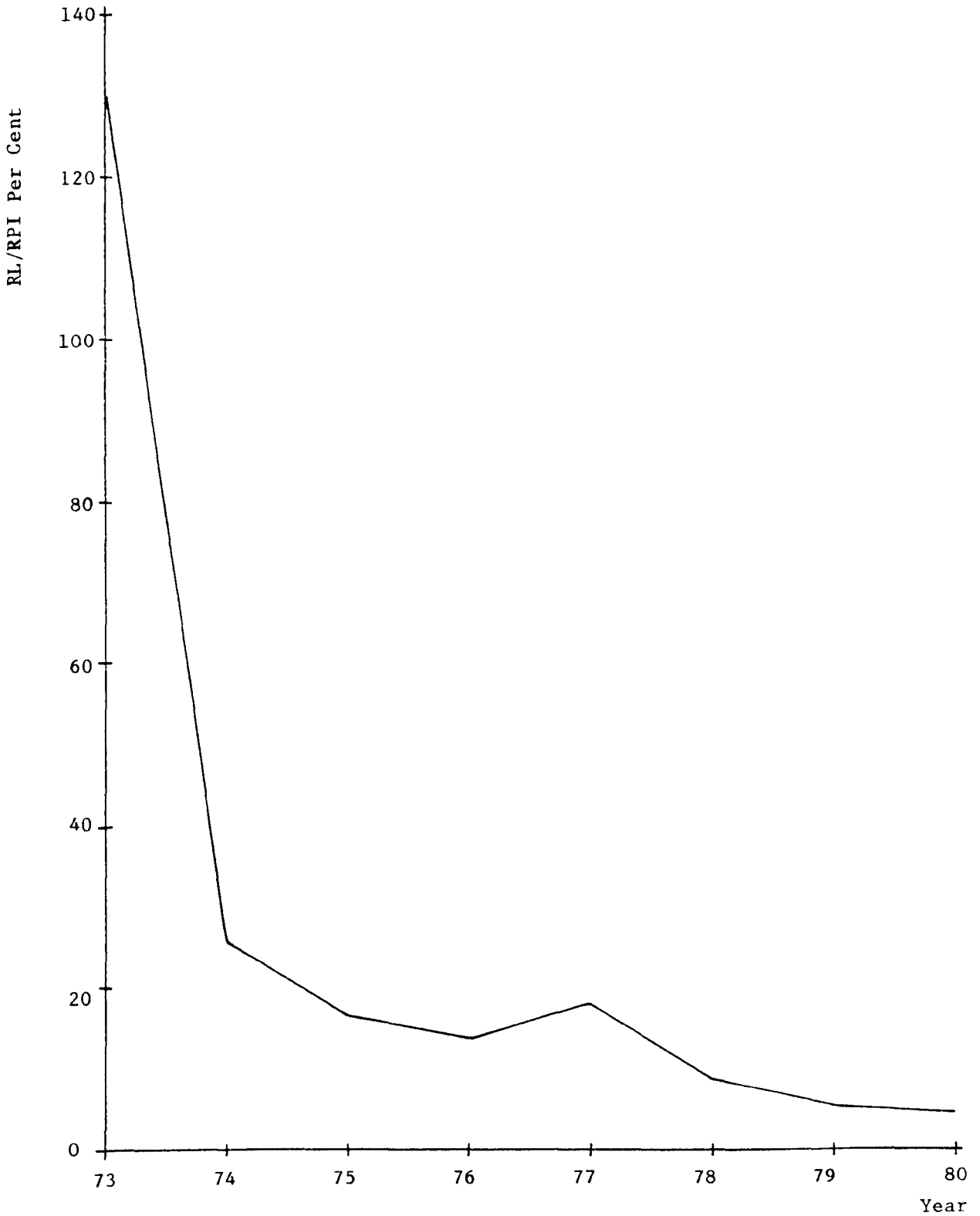
Year	GPI	RPI	$\frac{RPI}{GPI} \times 100$	RLs	$\frac{RL}{RPI} \times 100$
1973(6 months)	833	19	2.3	25 any one policy	131.6
1974	4,977	97	1.9	25	25.8
1975	8,873	243	2.7	40	16.5
1976	10,444	547	5.2	75	13.7
1977	15,276	415	2.7	75	18.1
1978	17,020	1,703	10.0	150	8.8
1979	24,263	2,788	11.5	150	5.4
1980	33,163	3,341	10.1	150	4.5

Company B

Marine cargo business is the largest class of insurance in the company's total business and Table 12.8 shows how the GPI, RPI and RL of marine cargo quota share and surplus treaties have all increased substantially over the period 1971-80, though the premium growth has been erratic with relatively very large increases in gross premiums in 1974 and 1979. By 1980, the GPI was twenty times higher than in 1971; the RPI has increased about twenty-nine fold

Figure 12.4

Retention Limit as a Percentage of Retained Premium Income for Marine Cargo Quota Share and 1st, 2nd and 3rd Surplus Treaties - Company A



over the same period. During the period 1971-80, the average annual growth rates of GPI and RPI were 39.6 per cent, and 45.2 per cent respectively, so that the proportion of the gross premium income retained by the company has increased to over one-quarter.

Table 12.8

Development of Gross Premiums, Retained Premium Income, and Retention Limits of Marine Cargo Quota Share and Surplus Treaties - Company B.
(000's omitted)

Year	GPI	RPI	$\frac{RPI}{GPI}$ x100	RLs (per policy)	$\frac{RL}{RPI}$ x100
1971	3,006	549	18.3	45	8.2
1972	2,965	716	24.2	60	8.4
1973	4,536	947	20.9	60	6.3
1974	13,121	2,876	21.9	60	2.1
1975	20,918	4,282	20.5	120	2.8
1976	18,062	4,356	24.1	150	3.4
1977	18,153	4,803	26.5	150	3.1
1978	22,699	6,333	27.9	375	5.9
1979	44,155	11,966	27.1	375	3.1
1980	60.719	15,787	26.0	375	2.4

The company's retention policy may have been shaped not only by the rapid growth of business but also by the rise in known and unknown accumulations of risk. Port and transport facilities were inadequate to cope with the increase in trade. In the mid-1970s the waiting time for ships to enter the main port exceeded two months

and large amounts of imported goods were left in congested, extremely hazardous conditions. However, the company did on four occasions increase its retention limit which by 1980 was more than eight times its 1971 level. Figure 12.5 shows that over the ten years, the maximum limit any one loss as a percentage to RPI ranges between 8.4 per cent in 1972 and 2.1 per cent in 1974 which is within the 'rule of thumb' limits.

The regular increases in their retention limits suggest that both companies wanted to get more benefit from the recent development in marine cargo business. Despite this fact the volume of RPI achieved by Company B from this class of business was relatively small. This is also the case with Company A, but the company's recent establishment justified such a small RPI.

12.3.1.3 Motor Business

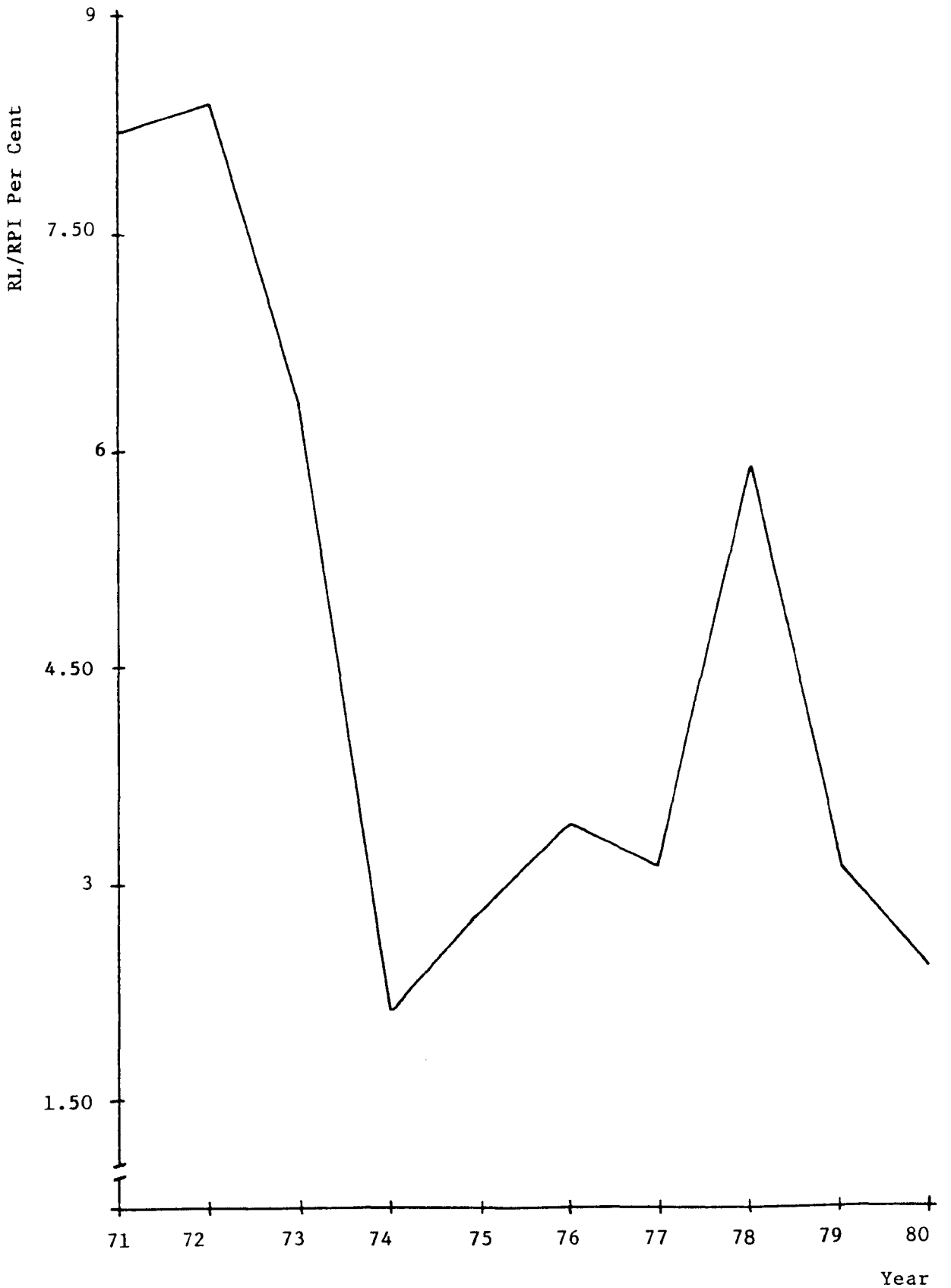
Over the last ten years, motor insurance premium income in most Arab countries has expanded rapidly due to increases in the numbers of vehicles, in the cost of repairs, and in the court awards to injured third parties, though the latter are still low relative to Western standards.

Company A

During the period 1974-80 company A's GPI increased almost eight-fold; the average annual growth rate being 41.2 per cent. The company has relied solely on excess of loss reinsurance to protect it against large claims, and as liability awards are still relatively low, it has been able to obtain the cover required for

Figure 12.5

Retention Limit as a Percentage of Retained Premium Income for Marine Cargo Quota Share and Surplus Treaties - Company B



only a modest premium. Consequently it has retained 91.6 per cent of its GPI over the period, and its RPI has grown almost ten-fold at an average annual growth rate of 46.0 per cent.

Table 12.9 shows that the company has increased its retention limit twice to maintain a ratio to RPI of under 1 per cent in marked contrast to fire and marine cargo business. The reasons for this difference in policy will be considered later when discussing the motor excess of loss cover of Company B.

Table 12.9

Development of Gross Premiums, Retained Premium Income, and Retention Limits of Motor Excess of Loss Cover - Company A (000's omitted)

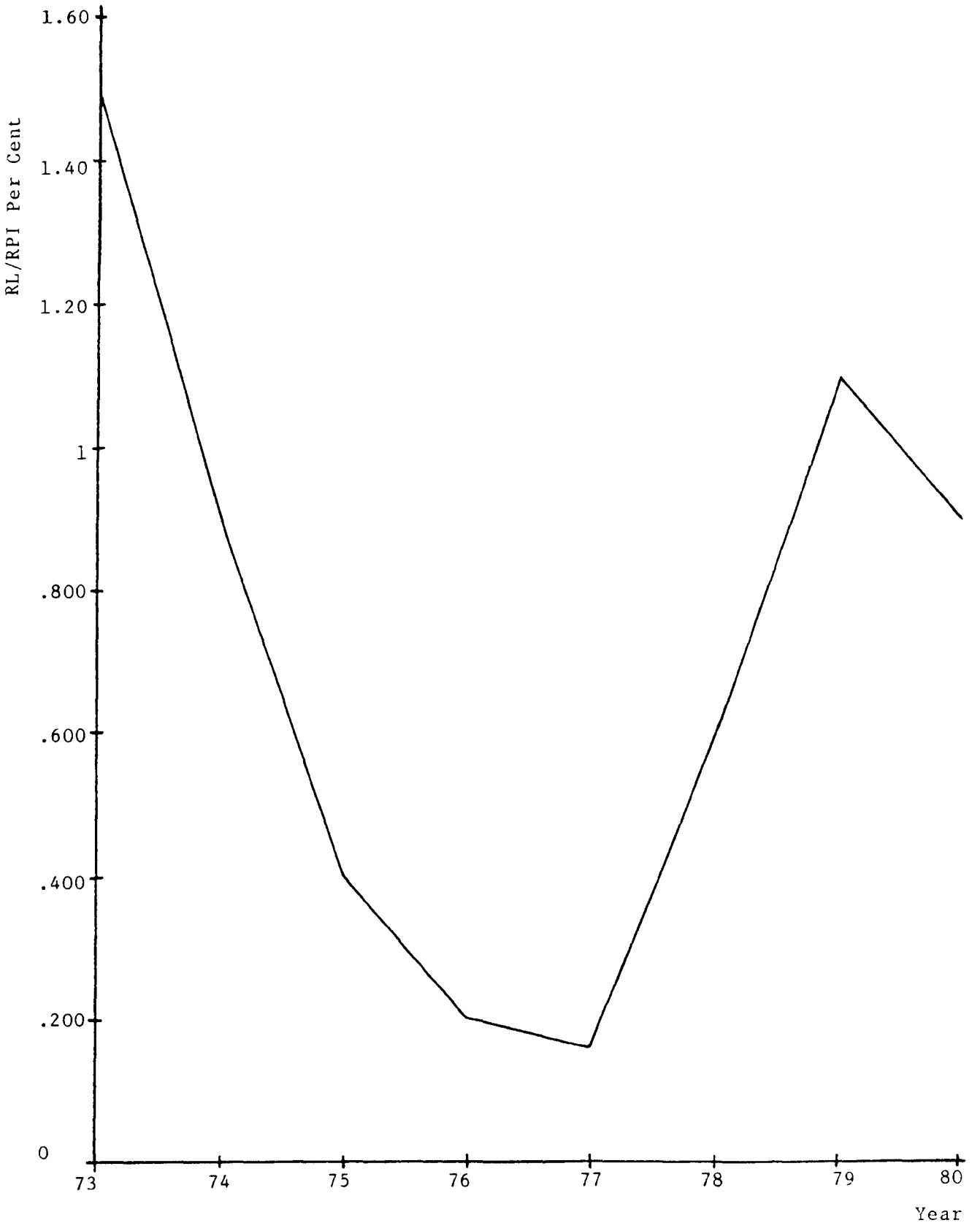
Year	GPI	RPI	$\frac{RPI}{GPI} \times 100$	RLs	$\frac{RL}{RPI} \times 100$
1973(6 months)	1,400	1,350	96.4	20	1.5
1974	2,750	2,200	80.0	20	0.9
1975	5,600	4,225	75.4	20	0.4
1976	10,500	9,075	86.4	20	0.2
1977	15,500	12,850	82.9	20	0.16
1978	17,450	16,613	95.2	100	0.6
1979	18,850	18,338	97.3	200	1.1
1980	21,800	21,343	97.9	200	0.9

Company B

Company B also achieved a high rate of growth in both GPI and RPI during the 1970s, both having increased more than fifteen fold between 1971 and 1980 at an average annual growth rate of more than 35 per cent (see Table 12.10). However, Company B was unable

Figure 12.6

Retention Limit as a Percentage of Retained Premium Income for Motor Excess of Loss Cover - Company A



to retain as high a proportion of its GPI as Company A because of the obligation to cede more than 20 per cent quota share to the state reinsurance company. It also effected an excess of loss reinsurance as protection against large claims for, apparently, a relatively small premium.

The company has raised its retention limit at five year intervals, and as can be seen from Table 12.10 and Figure 12.7, since 1975 the ratio of the retention limit to its RPI has consistently been below 1 per cent. Like Company A, a lower retention limit has been fixed for motor insurance than for fire and marine cargo business. This is because: (i) retention limits under excess of loss covers should always be lower than for surplus treaties for the reasons mentioned in Chapter eleven; (ii) a serious accident under a comprehensive policy, for instance, may involve many sections of the policy, e.g. own damage, third party liability, personal accident benefits, medical expenses, etc; and (iii) there is the risk of an accumulation of losses from collisions involving two or more policyholders.

12.3.2 Retention Limits in Relation to Total Retained Premium Income

Both companies in answering the questionnaire said that they fix their retention limits with regard to their retained premium incomes. However it is not known whether each class of insurance is considered in isolation, as in the above analysis, or whether the company's total retained premium income for all of its business is taken into account in fixing the individual class retention

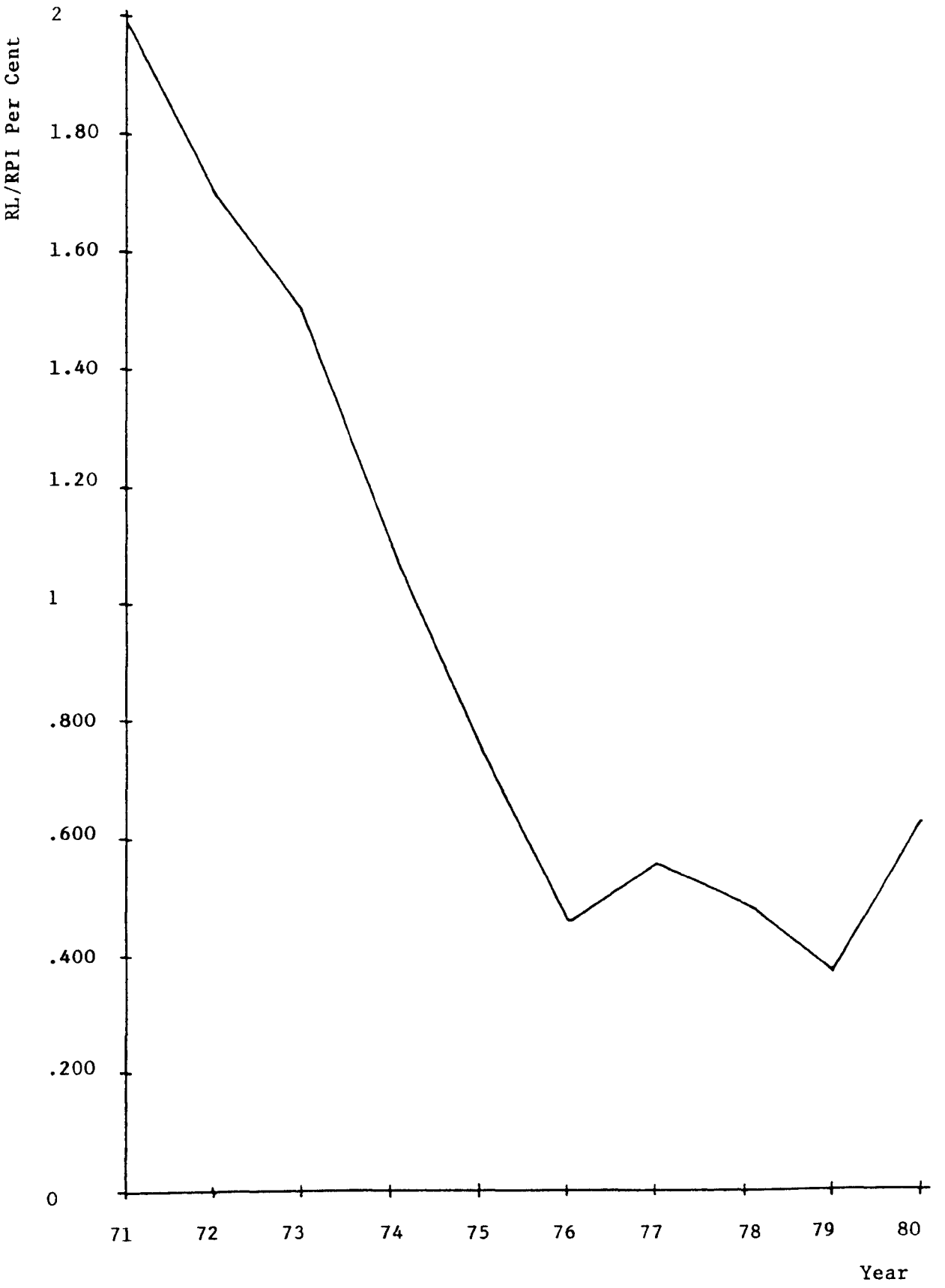
Table 12.10

Development of Gross Premiums, Retained Premium Income and Retention Limits for Motor Excess of Loss Reinsurance - Company B
(000's omitted)

Year	GPI	RPI	$\frac{RPI}{GPI} \times 100$	RLs	$\frac{RL}{RPI} \times 100$
1971	1,349	1,004	74.4	20	2.0
1972	1,607	1,187	73.9	20	1.7
1973	1,775	1,310	73.8	20	1.5
1974	2,365	1,762	74.5	20	1.1
1975	5,254	3,926	74.7	30	0.76
1976	8,804	6,577	74.7	30	0.46
1977	7,207	5,383	74.7	30	0.56
1978	8,160	6,096	74.7	30	0.49
1979	12,291	9.181	74.7	30	0.37
1980	21,157	15,846	74.9	100	0.63

Figure 12.7

Retention Limit as a Percentage of Retained Premium Income for Motor Excess of Loss Cover - Company B



limits. Therefore, and in order to see the differences between the class RLs on that basis, Tables 12.11 and 12.12 compare the retention limits for the three main classes of insurance against the companies' total retained premium incomes. As can be seen, apart from Motor business for Company A, both companies' retention limits expressed as a percentage of TRPI have fallen substantially, and by 1980 all were well below the rule of thumb ratio guidelines for companies of their sizes.

Summary

An overall picture of the development of GPI, RPI and RL, and the relationship between RL and RPI for fire, marine cargo and motor business is given in Table 12.13.

As can be seen, both companies' GPI's increased very substantially over the periods covered, with the more newly established Company A generally achieving the fastest growth rates. Whereas Company A increased the proportion of its premium income retained for its own account in all three classes of insurance, Company B did so only for marine cargo, and by 1980 both companies were still ceding to reinsurers a large proportion of their premium incomes other than for motor insurance.

As noted above, both companies said in response to the questionnaire that they fixed their retention limits with regards to the retained premium income. Although with both companies the retention limits in both absolute terms and as a ratio to the retained premium income for each class of insurance varied substantially:

Table 12.11

Relationship between RL and Total Retained Premium Income for all Classes - Company A

Year	TRPI (000's)	RLs Fire	$\frac{RL}{TRPI} \times 100$	RLs Marine	$\frac{RL}{TRPI} \times 100$	RLs Motor	$\frac{RL}{TRPI} \times 100$
1973/74	3,605	250	6.9	25	0.7	20	0.6
1975	4,720	250	5.3	40	0.8	20	0.4
1976	10,088	250	2.5	75	0.7	20	0.2
1977	14,007	500	3.6	75	0.5	20	0.1
1978	20,096	500	2.5	150	0.7	100	0.5
1979	24,126	500	2.1	150	0.6	200	0.8
1980	27,867	500	1.8	150	0.5	200	0.7

Figure 12.8

Retention Limit as a Percentage of Total Retained Premium Income for all Classes of Insurance - Company A

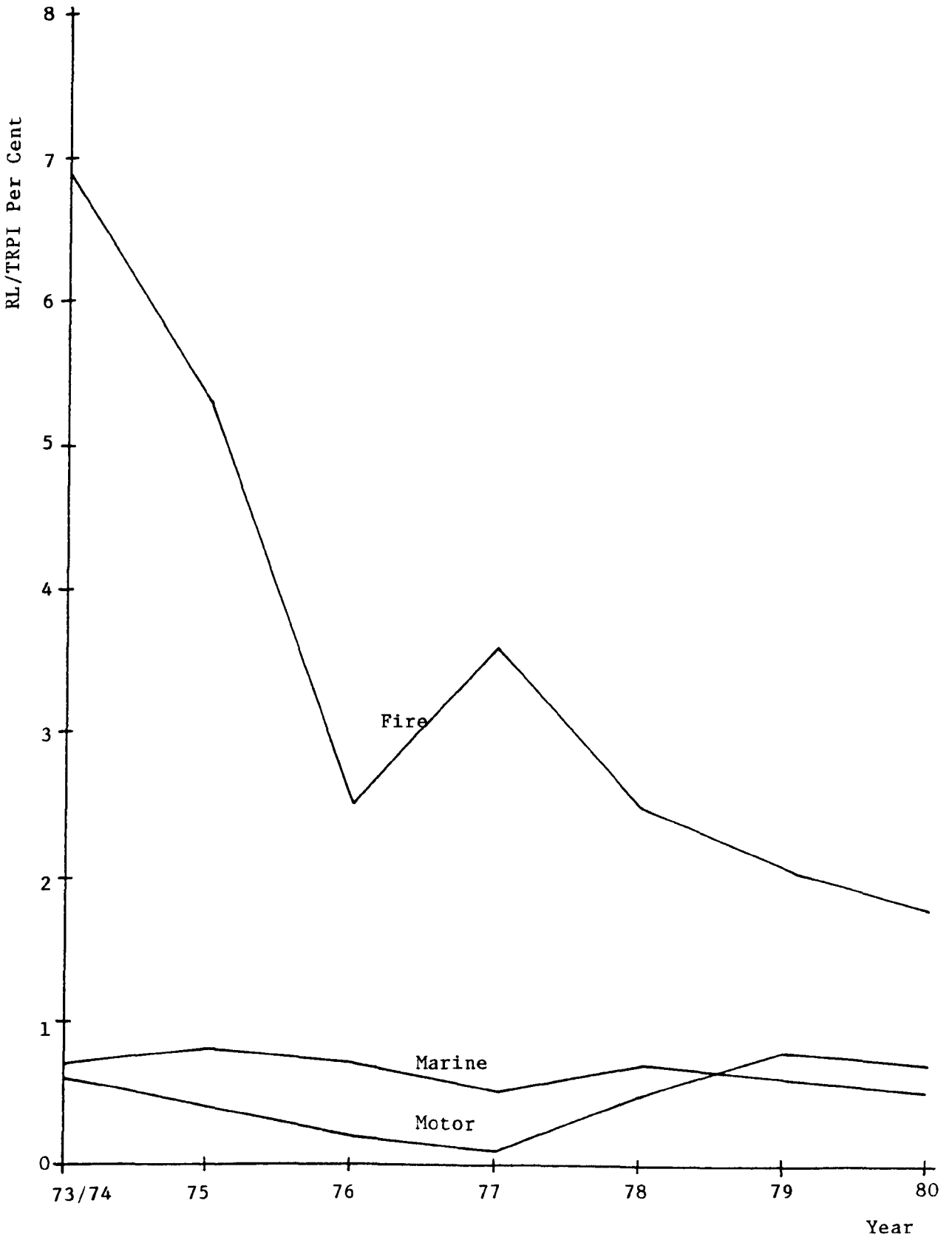


Table 12.12

Relationship between RL and Total Retained Premium Income for all Classes - Company B

Year	TRPI (000's)	RLs Fire	$\frac{RL}{TRPI} \times 100$	RLs Marine	$\frac{RL}{TRPI} \times 100$	RLs Motor	$\frac{RL}{TRPI} \times 100$
1971	2,168	40	1.8	45	2.1	20	0.9
1972	2,686	40	1.5	60	2.2	20	0.7
1973	3,178	40	1.3	60	1.9	20	0.6
1974	5,777	40	0.7	60	1.0	20	0.3
1975	10,399	75	0.7	120	1.2	30	0.3
1976	13,359	75	0.6	150	1.1	30	0.2
1977	14,047	75	0.5	150	1.1	30	0.2
1978	16,793	75	0.4	375	2.2	30	0.2
1979	26,187	75	0.3	375	1.4	30	0.1
1980	38,265	75	0.2	375	1.0	100	0.3

Figure 12.9

Retention Limit as a Percentage of Total Retained Premium Income for all Classes of Insurance - Company B

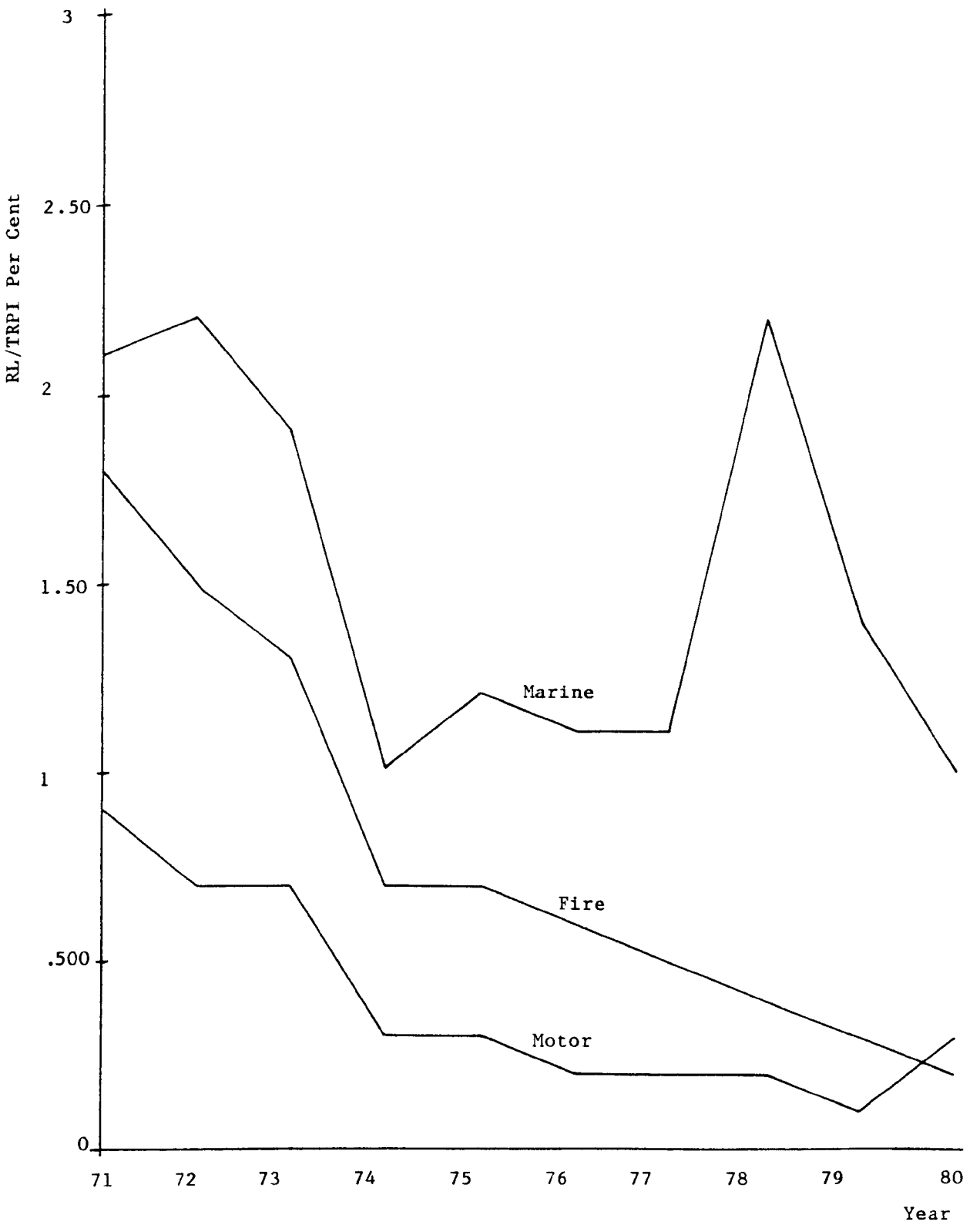


Table 12.13

Summary of Development of GPI, RPI, TRPI and RLs for both Company A and B

Class of insurance	Factors	Company A 1974-80	Company B 1971-80
Fire	GPI increase over period	X 32.14	X 9.95
	RPI " " "	X 50.57	X 9.10
	RL " " "	X 2.00	X 1.88
	RL / RPI	fallen from 1190.5% to 47.1%	fallen from 12.2% to 2.5%
	RL / TRPI	fallen from 6.9% to 1.8%	fallen from 1.8% to 0.2%
	RPI / GPI	fluctuated between 2.4% and 5.2%	fluctuated between 22.4% and 31.1%
Marine Cargo	GPI increase over period	X 6.66	X 20.20
	RPI " " "	X 34.44	X 28.76
	RL " " "	X 6.00	X 8.33
	RL / RPI	fallen from 25.8% to 4.5%	fluctuated between 2.4% and 8.4%
	RL / TRPI	fluctuated between 0.5% and 0.8%	fluctuated between 1.0% and 2.2%
	RPI / GPI	fluctuated between 1.9% and 11.5%	fluctuated between 18.3% and 27.9%
Motor	GPI increase over period	X 7.92	X 15.68
	RPI " " "	X 9.70	X 15.78
	RL " " "	X 10.00	X 5.00
	RL / RPI	fluctuated between 0.2% and 1.1%	fluctuated between 0.37% and 2.0%
	PL / TRPI	fluctuated between 0.1% and 0.8%	fluctuated between 0.1% and 0.9%
	RPI / GPI	fluctuated between 75.4% and 97.9%	fluctuated between 73.8% and 74.9%

(i) as percentages of the class RPIs, by the end of the period, they were within the 'rule of thumb' guidelines for companies of their size with the sole exception of Company A's fire retention limit for its proportional treaties, though the maximum retained loss was further reduced by an over-riding per risk excess of loss reinsurance; and

(ii) expressed as percentages of the companies' total retained premium incomes, by 1980 all of their retention limits were well below the guidelines.

Regarding the revision intervals for retention limits, in response to the questionnaire Company A said that the RLs of its fire and marine treaties are revised every three years, and its motor excess of loss cover every four years. Company B said that RLs of all its reinsurance treaties are reviewed every three years. In fact, the data in the above tables shows that generally the two companies have not adhered to those periods, and actual revision periods have ranged from one to six years.

By leaving a retention limit unchanged for several years during a period of inflation its real value may fall substantially. It is not possible to show exactly how inflation affected the RLs of Companies A and B because of the lack of adequate inflation statistics for the countries concerned. However, if the average annual rate of inflation over the period is assumed to have been 7 per cent (the 1969-78 average for Company B's country), the real values of the RLs on the companies' fire treaties, for instance, would have declined as shown in Table 12.14.

Table 12.14

The Effect of Inflation on Retention Limits of Fire Treaties for Company A and B

Year	Company B Original RLs	Company B RLs after applying inflation	Company A Original RLs	Company A RLs after applying inflation
1971	40,000	40,000	-	-
1972	40,000	37,200	-	-
1973	40,000	34,596	250,000	250,000
1974	40,000	32,174	250,000	232,500
1975	75,000	56,104	250,000	216,225
1976	75,000	52,177	250,000	201,089
1977	75,000	48,524	500,000	374,026
1978	75,000	45,128	500,000	347,844
1979	75,000	41,969	500,000	323,495
1980	75,000	39,031	500,000	300,850

12.3.3 Relationship Between Retention Limits and Capital/Free Reserves

Retention limits as a percentage of capital and free reserves do vary substantially from one company to another and may lie well outside the 'rule of thumb' figures, depending on the company's size and other factors. In this section it is intended to discuss the relationship between RL and CFRs in fire, marine and motor business for Company A and B.

Company A

Table 12.15 shows that from 1973 to 1980 the company's total CFRs increased almost twenty-two fold, with an average annual growth rate of 55.4 per cent (i.e. capital (C) which has been raised twice has risen six-fold, while free reserves (FRs) have risen more than a hundred and forty-two fold).

Throughout the eight years covered by the table the retention limits for all three classes of business were well below the ratios to capital and free reserves indicated by the' rules of thumb' limits. The company succeeded in doing more than merely financing the growth of its retained premium income, as shown by the fall in the ratios of RLs to CFRs. Clearly in fixing its retention limits capital resources have not been an unduly burdensome constraint.

Company B

Although there was no change in the company's paid-up capital (C) during the period 1971-1980, its free reserves (FR) increased almost ten-fold. Possibly the management believed that, particularly as the company is backed by the state, there is no need for it to increase its share capital so long as it can finance the growth of its business from retained earnings, though a case could be made for the capitalisation of some of its reserves.

In fact the 28.9 per cent average annual growth rate of the free reserves failed to match the 36.8 per cent annual growth rate of the company's total gross premium income. Nevertheless the percentages of RL to CFRs in fire and motor business have declined during the period 1971-80 due to the continuous increase in CFRs on the one hand, and the stabilisation of RLs on the other. In

TABLE 12.15

The Relationship between the Capital/Free Reserves and Retention Limits for Fire, Marine and Motor Business - Company A
(000's omitted)

Year	Cs	FRs	CFRs	RL Fire	$\frac{RL}{CFRs} \times 100$	RL Marine	$\frac{RL}{CFRs} \times 100$	RL Motor	$\frac{RL}{CFRs} \times 100$
1973	5,000	656	5,656	250	4.42	25	0.44	20	0.35
1974	5,000	3,598	8,598	250	2.91	25	0.29	20	0.23
1975	5,000	11,639	16,639	250	1.50	40	0.24	20	0.12
1976	10,000	15,019	25,019	250	1.00	75	0.30	20	0.08
1977	10,000	30,978	40,978	500	1.22	75	0.18	20	0.05
1978	10,000	48,543	58,543	500	0.85	150	0.26	100	0.17
1979	30,000	53,642	83,642	500	0.60	150	0.18	200	0.24
1980	30,000	93,537	123,537	500	0.40	150	0.12	200	0.16

Figure 12.10

Retention Limit of Fire, Marine Cargo and Motor Business as a Percentage of Capital/Free Reserves - Company A

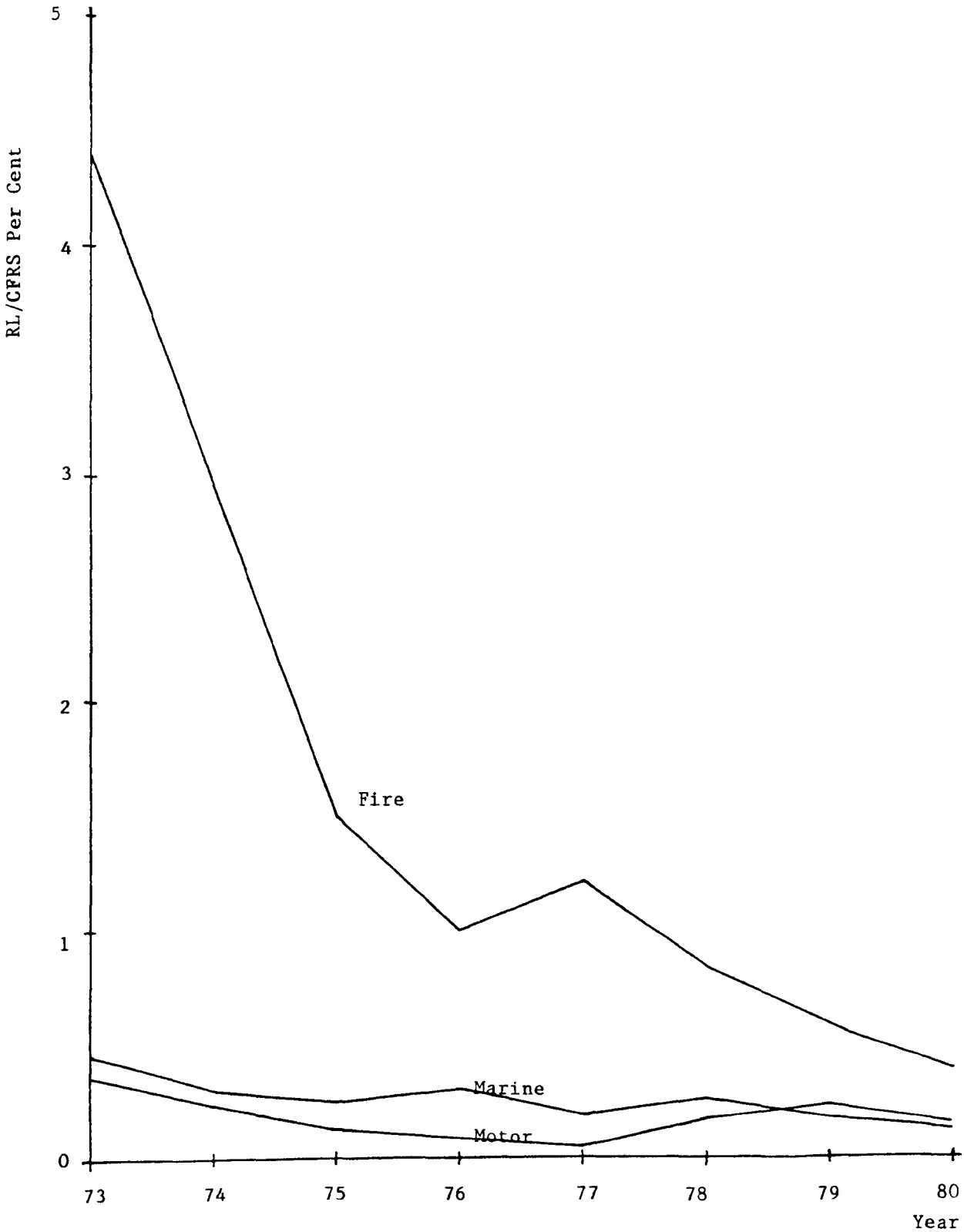


Table 12.16

The Relationship between the Free Capital and Retention Limits for Fire, Marine, and Motor Business - Company B
(000's omitted)

Year	C	FRs	CFRs	RLs Fire	$\frac{RL}{CFRs} \times 100$	RLs Marine	$\frac{RL}{CFRs} \times 100$	RLs Motor	$\frac{RL}{CFRs} \times 100$
1971	1,000	1,547	2,547	40	1.6	45	1.6	20	0.79
1972	1,000	1,795	2,795	40	1.4	60	2.1	20	0.72
1973	1,000	2,143	3,143	40	1.3	60	1.9	20	0.64
1974	1,000	2,682	3,682	40	1.1	60	1.6	20	0.54
1975	1,000	3,711	4,711	75	1.6	120	2.5	30	0.64
1976	1,000	5,594	6,594	75	1.1	150	2.3	30	0.46
1977	1,000	7,218	8,218	75	0.9	150	1.8	30	0.36
1978	1,000	9,277	10,277	75	0.73	375	3.7	30	0.29
1979	1,000	12,382	13,382	75	0.56	375	2.8	30	0.22
1980	1,000	15,158	16,158	75	0.46	375	2.3	100	0.62

both motor and fire business, except for the period 1971-76 in the latter, the percentages of RL to CFRs were below the 'rule of thumb' limit; in marine business, however, it was within the guidelines. The relationship between RL and CFRs is illustrated in Figure 12.11.

Summary

The above findings on the relationship between RL and CFRs are summarised in Table 12.17.

From Table 12.17 it can be seen that the rate of growth in Company A's CFRs has increased much faster than in Company B. The main reason for this may be attributed to the difference in the attitudes of the two companies' management towards the achievement of their financial strength objectives. Apart from marine business in Company B, both companies continued to show a decrease in the RL as a percentage of CFRs during the period of analysis, and by 1980 this percentage was well below the 'rule of thumb' limit.

12.3.4 Retention Limit Per Event

The two companies also provided details of their marine cargo retention limits for accumulations of losses arising from any one event, and these too will be compared with the 'rule of thumb' guidelines first discussed in Chapter nine, i.e.[1]:-

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(1) Details of catastrophe cover for their fire accounts are not available.

Figure 12.11

Retention Limit of Fire, Marine Cargo and Motor Business as a Percentage of Capital/Free Reserves - Company B

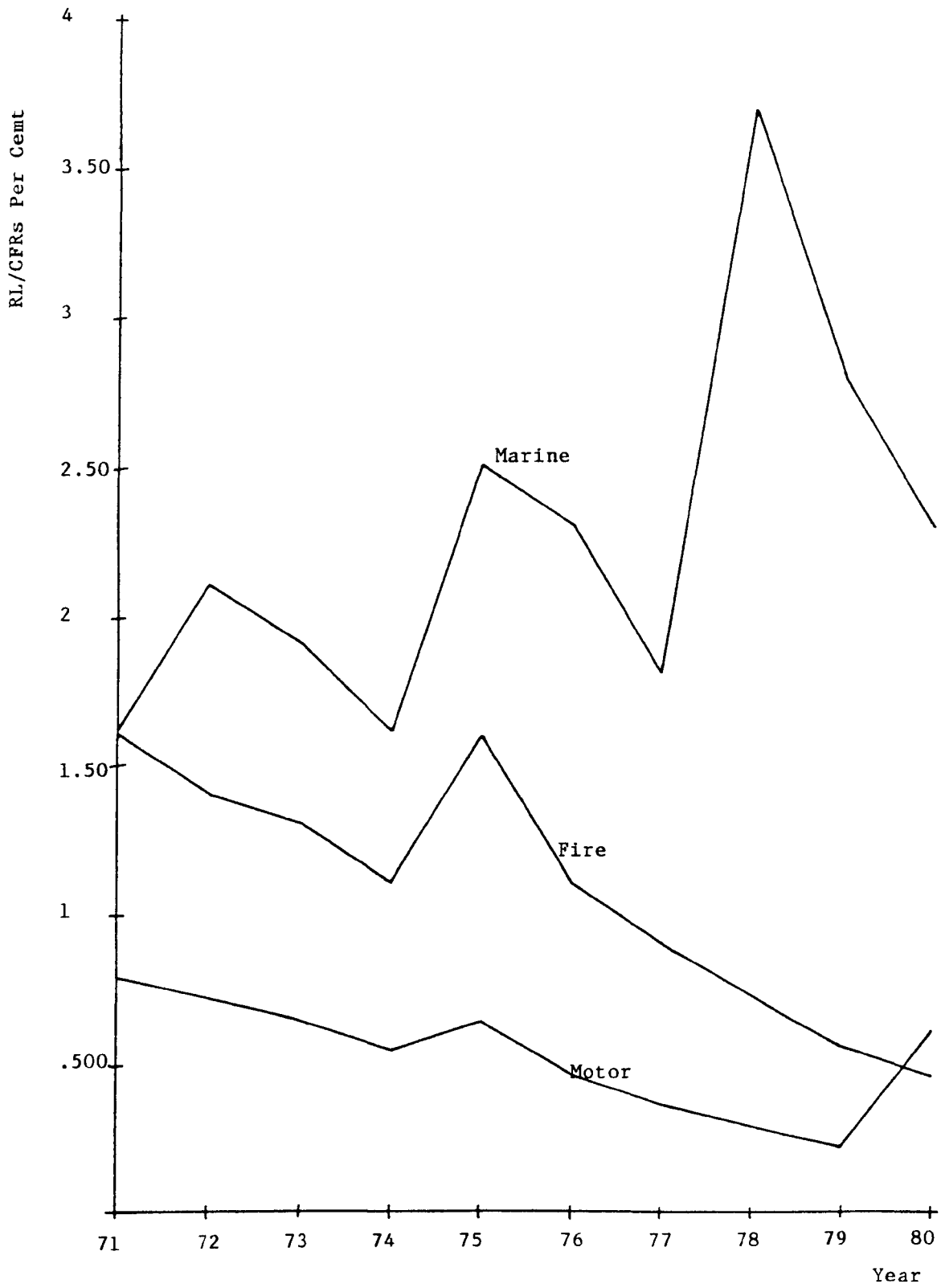


Table 12.17

Summary of Development of CFRs and their Relationship with RLs for both Company A and B

Class of insurance	Factors	Company A 1974-80	Company B 1971-80
All Classes	C increase over period	X 6.00	X 0
	FRs " "	X 26.00	X 9.80
	C&FRs " "	X 14.37	X 6.34
Fire	RL " "	X 2.00	X 1.88
	$\frac{RL}{CFRs}$	fallen from 2.91% to 0.40%	fallen from 1.6% to 0.46%
Marine Cargo	RL increase over period	X 6.00	X 8.33
	$\frac{RL}{CFRs}$	fluctuated between 0.12% and 0.30%	fluctuated between 1.6% and 3.7%
Motor	RL increase over period	X 10.00	X 5.00
	$\frac{RL}{CFRs}$	fluctuated between 0.05% and 0.24%	fluctuated between 0.22% and 0.79%

Retention Limit Guidelines for Catastrophe Risks:

Type of Relationship	Non-Life branches	Marine
Retention Limit(per event) / Retained premium income	-	As high as 5%
Retention Limit(per event) / Capital and free reserves	Around 0.5% to 1.5%	-

Company A

Over the six years RL per event for marine cargo was revised twice and increased by 250 percent, from 80,000 in 1975 to 200,000 in 1978, as shown in Table 12.18. The percentage of RL to the RPI dropped from 32.92 per cent in 1975 to 5.97 per cent in 1980, which is abovethe 'rule of thumb' limit. By 1980 the RL as a percentage of CFRs was far below the 'rule of thumb' limit (see Figure 12.12 and 12.13).

Table 12.18

Retention Limits Per Event as a Percentage of Retained Premium Income and Capital/Free Reserves for Marine Cargo Excess of Loss - Company A
(000's omitted)

Year	RPI	CFRs	RLs	$\frac{RL}{RPI} \times 100$	$\frac{RL}{CFRs} \times 100$
1975	243	16,639	80	32.92	0.48
1976	547	25,019	100	18.28	0.40
1977	415	40,978	100	24.10	0.24
1978	1,703	58,543	200	11.74	0.34
1979	2,788	83,642	200	7.17	0.24
1980	3,341	123,537	200	5.97	0.16

Figure 12.12

Retention Limit per Event as a Percentage of Retained Premium Income of Marine Cargo Business - Company A

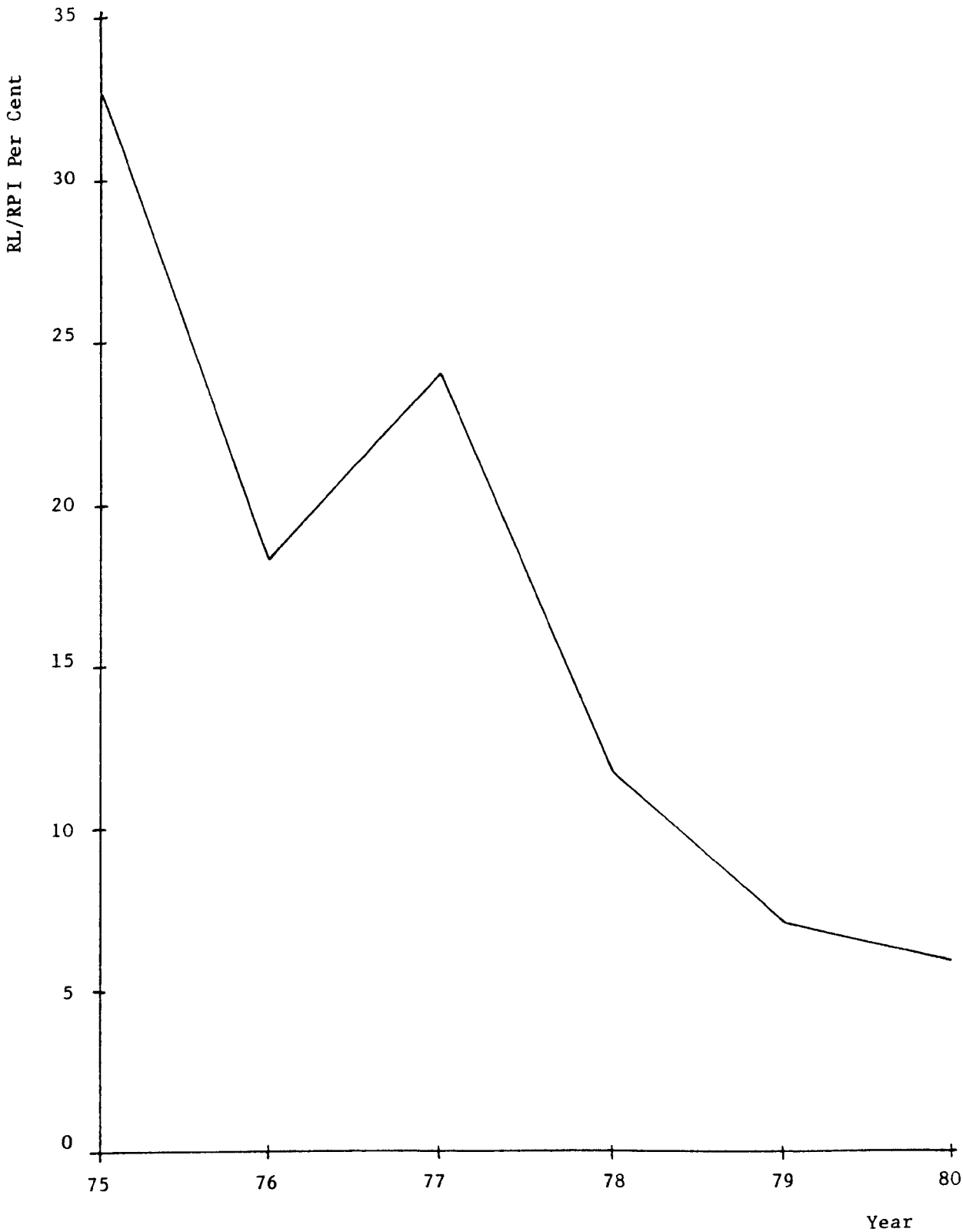
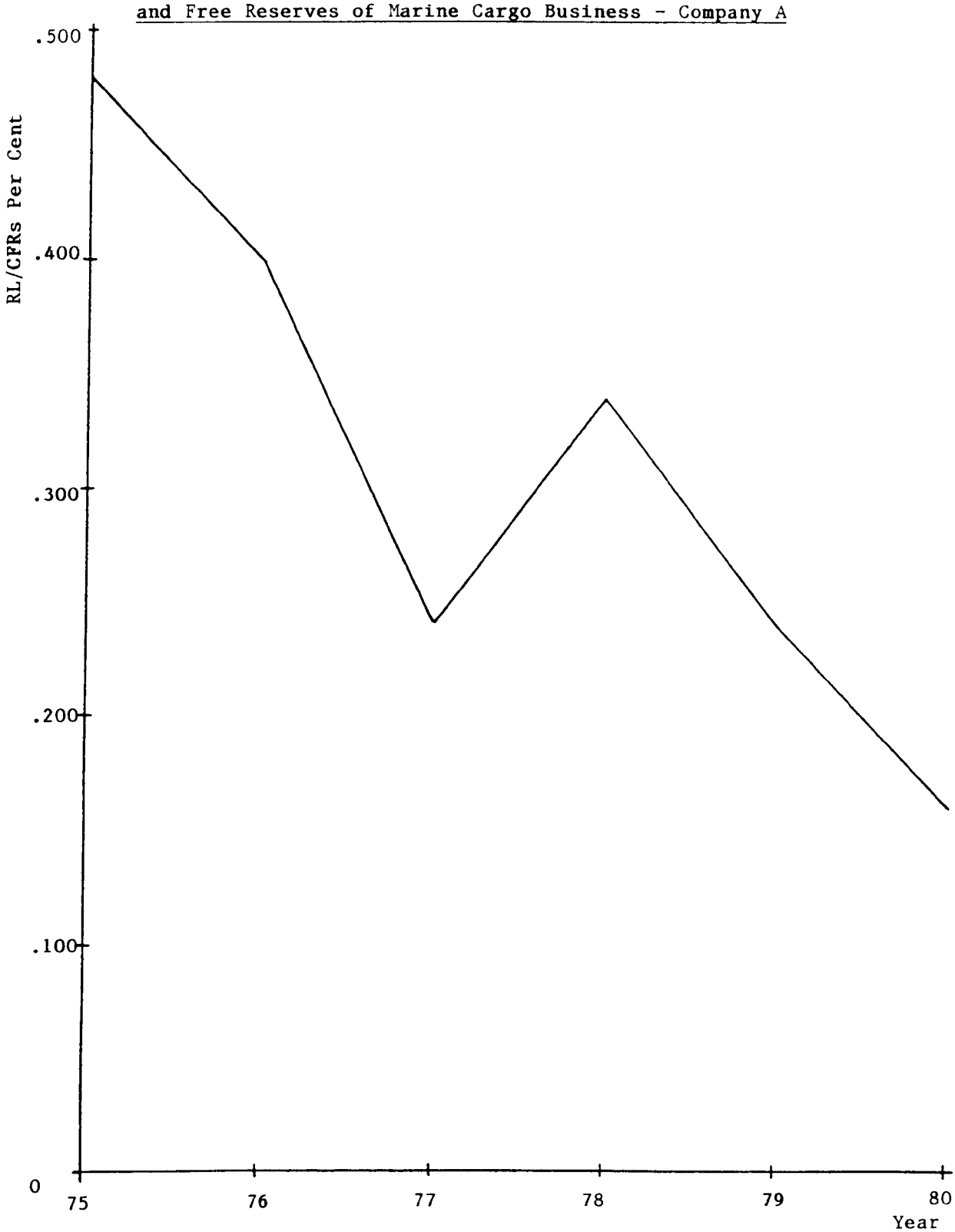


Figure 12.13

Retention Limit per Event as a Percentage of Capital and Free Reserves of Marine Cargo Business - Company A



Company B

Table 12.19 shows that, during the period 1975-80, the maximum limit of any one event as a percentage of RPI was relatively high, although by 1980 it had dropped to 4.75 per cent, which is still above the 'rule of thumb' guidelines; unlike Company A, the percentage of RL to the CFRs was high and far above the 'rule of thumb' limit. The percentage of RL to RPI and CFRs is illustrated in Figure 12.14 and 12.15 respectively.

We have seen in Chapter eleven that, in practice, the RL per event could be ranged between two to four times the RL per risk or individual loss. In this context, apart from 1975, RLs for Company A's marine cargo were less than twice its RLs per risk, while for Company B they were exactly twice its RLs per risk.

Nevertheless. although catastrophic events are comparatively infrequent, companies should accumulate special reserves to meet such events when they do occur. Therefore companies when determining their RL per event should also take these reserves into consideration.

Table 12.19

Retention Limits Per Event as a Percentage of Retained Premium Income and Capital/Free Reserves for Marine Cargo Excess of Loss - Company B
(000's omitted)

Year	RPI	CFRs	RLs	$\frac{RL}{RPI} \times 100$	$\frac{RL}{CFRs} \times 100$
1975	4,282	4,711	300	7.01	6.37
1976	4,356	6,594	300	6.89	4.55
1977	4,803	8,218	300	6.25	3.65
1978	6,333	10,277	750	11.84	7.30
1979	11,966	13,382	750	6.27	5.60
1980	15,787	16,158	750	4.75	4.64

Figure 12.14

Retention Limit per Event as a Percentage of Retained Premium Income of Marine Cargo Business - Company B

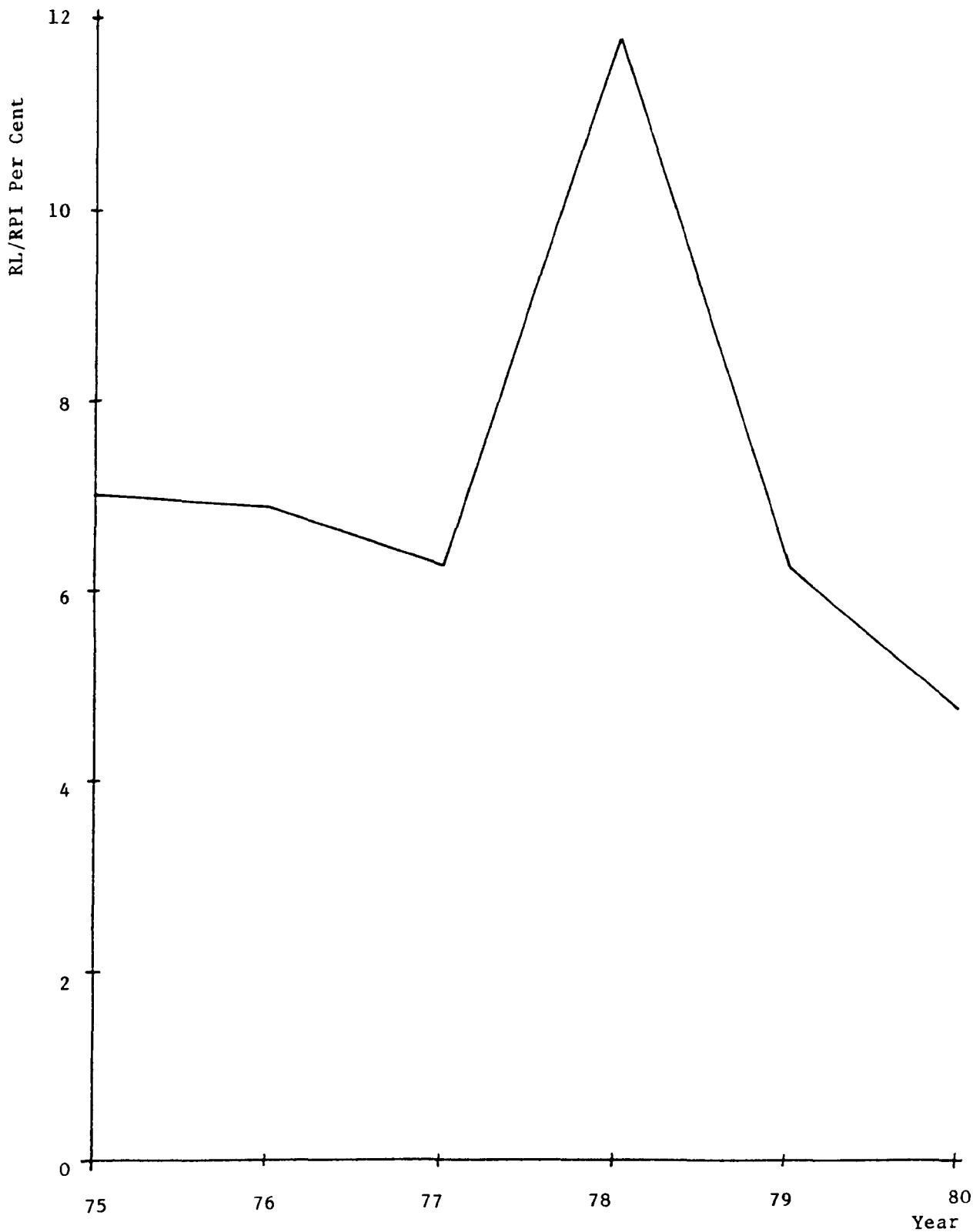
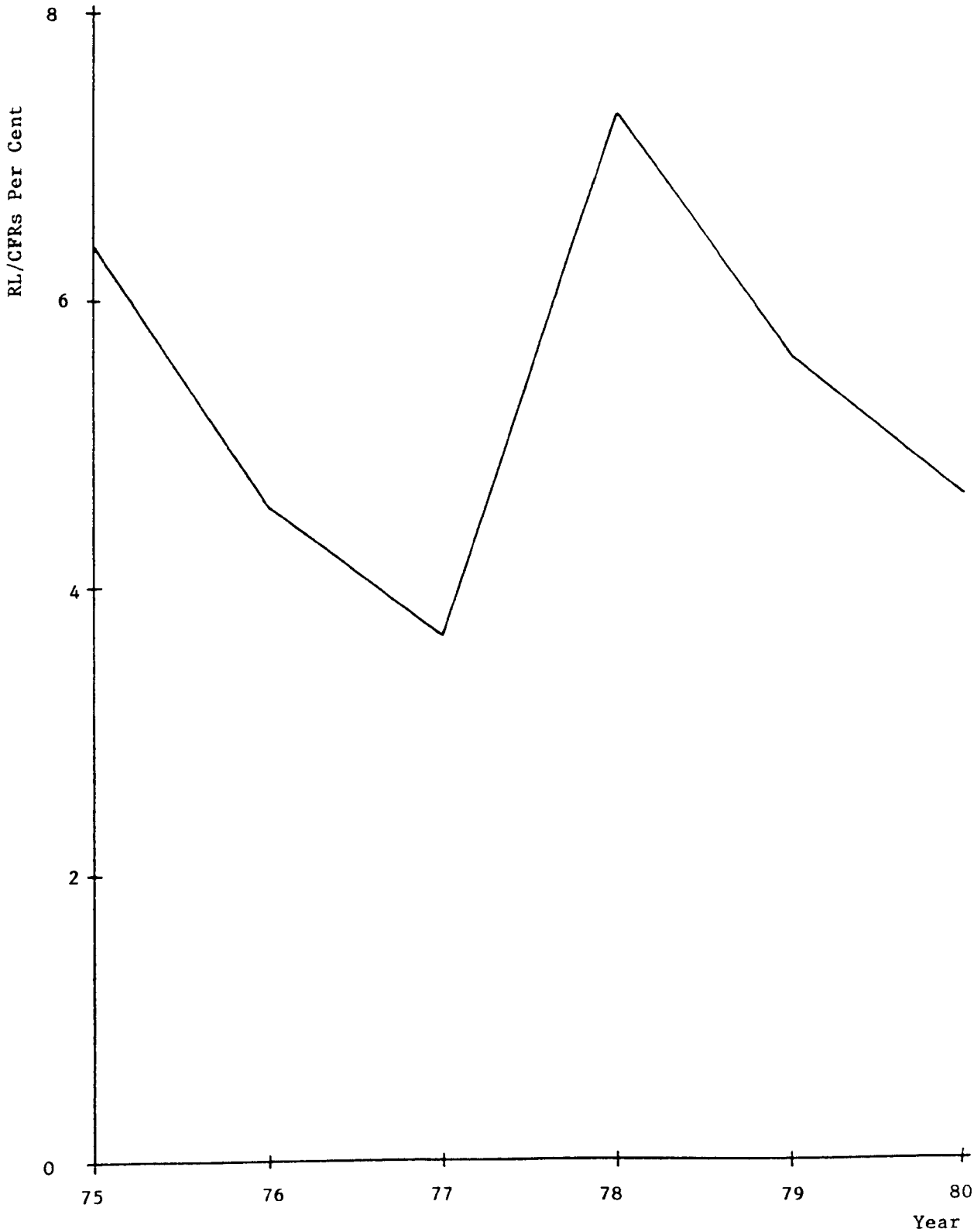


Figure 12.15

Retention Limit per Event as a Percentage
of Capital/Free Reserves of Marine Cargo Business - Company B



12.4 Conclusions

This chapter has attempted to discuss the results of the questionnaire, and analyse the relationship between RL, RPI, and CFRs in three classes of insurance (i.e. fire, marine cargo and motor) for two Arab insurance companies. The main conclusions are:

1. During the period under discussion, the GPI, RPI, RLs,and CFRs of Company A and B have experienced rapid growth.
2. Both companies' RLs have not been revised soon enough, and have been too far out of step with the increase of the GPI or CFRs. This has resulted in the companies' GPI growth being exposed to more reinsurance premiums ceded, and the consequent hampering of the development of RPI. It may be, however, that the companies do review their RLs at regular intervals, but for various undisclosed reasons (e.g. market conditions) they may not revise them despite RL/RPI and RL/CFRs ratios becoming unaligned in relation to their targets.
3. Owing to the markedly different economic and political situations in which Company A (competitive market) and Company B (monopoly market) operate, it is difficult to make any realistic comparison of their relative performance. All that can meaningfully be noted is that the more recently established Company A has experienced more rapid overall growth rates in GPI, RPI and CFRs than has Company B.
4. For both companies RL as a percentage of RPI or CFRs has fluctuated highly for all classes under study. Unless the companies have a certain policy in determining their RLs, then the two ratios might well diverge in the ways shown.

5. Although the RL as a percentage of RPI may be more consistent when we measure RPI on total business than on a class basis, in practice it is unusual to fix RL to total retained premium income. This is especially so given the possibility of an accumulation risk which may involve several classes of insurance when the total retained claims costs may amount to an unacceptably large proportion of the company's TRPI.

6. It is neither really practical to revise RLs at yearly intervals (especially given the uncertainty regarding business development for a company in a competitive market), nor to maintain them unrevised for several years. Therefore, RLs should be revised at short intervals (e.g. every two years), and normally increased in line with inflation.

7. Obtaining the proper relationship between RL, RPI, and CFRs is only part of the required solution; the determination of an adequate RL is also necessary. Therefore, those involved in fixing RLs should be well aware of how much the maximum loss per risk or per event would take from RPI or CFRs. They must also look not just to the past but must also try to formulate a view of the future.

CHAPTER THIRTEEN

Summary and Conclusion

13.1 Introduction

The investigation into the available domestic retention capacity and the demand for international reinsurance in the Arab World comprised:

(i) a survey of relevant information and literature on the development of Arab insurance industries;

(ii) an analysis of some restrictions imposed on retention capacity;

(iii) a discussion of unusual demands for market capacity;

(iv) the establishment of reinsurance companies and pools as measures of increasing retention capacity;

(v) an extensive theoretical and empirical study of the determination of retention limits; and

(vi) a discussion on related points arising from the research.

This chapter provides, by way of conclusion, a presentation of the study's objectives, techniques, results, findings, and implications of the work as a whole.

13.2 Presentation of the Study

1. An initial discussion of economic development in the

Arab World provided a background to the main study, and in particular to the available domestic retention capacity and the demand for foreign reinsurance. Special significance was given to the major developments in the various sectors of the economy during the period studied.

2. An examination of the development and current situation of Arab insurance industries provided a general framework for the study of retention capacity. The main points that emerged were:

(i) Modern insurance in the Arab World began with foreign insurance companies; but since the 1960s national insurance industries have developed in most Arab countries and locally owned Arab companies have acquired a predominant share of Arab direct insurance business.

(ii) The structure of the insurance markets of Arab countries ranges from monopoly to highly competitive markets, including national and foreign insurers.

(iii) By 1979 the total life and non-life insurance premium income of all Arab insurance markets still amounted to only 0.82 per cent of the world's direct premium income (excluding the Communist bloc), despite the former having grown at an average annual rate of 31.5 per cent (for both non-life and life business) during the period 1974-79. Although all Arab countries suffered from inflation, real growth of premium income was high.

(iv) Despite considerable growth in the premium expenditure per capita in Arab countries during the period 1974-

79, it is still small when compared with the developed countries.

(v) Despite the problems of instability in the Arab region, the future will see, on the whole, a great increase in the volume of insurance business, and the non-life business will continue to be predominant in the companies' portfolios.

3. Restrictions on retention capacity derived from the existence or absence of insurance legislation and supervision were discussed. The need for new legislation to replace or improve inadequate regulations, in order to meet the rapid development in the Arab insurance industries, was noted. The urgent need for legislation in some Arab countries, where regulation and supervision are minimal was observed. To improve insurance regulations two suggestions were made; firstly, that an advisory committee be established within the General Arab Insurance Federation, or - if this were not forthcoming - recourse should be led to the United Nations Development Programme.

4. The rapid growth in the number and size of large risks throughout the Arab region, due to economic development, was examined. The conclusions from that study were that the increase in both the numbers and the size of these risks was impressive considering the short period of time in which they have emerged in the region. It has led to problems of risk assessment, premium rating, claims settlements, and unbalanced portfolios with which local insurers are ill-equipped to handle. Consequently only a minute part of the gross premium income for

large risks is retained locally and for the foreseeable future large risks will continue to be heavily reinsured abroad. Various suggestions were made for increasing retention capacity in respect of individual large risks. These suggestions were aimed at overcoming the inability of individual insurers to retain more than a small proportion of such risks, and therefore it was recommended that: (i) attention should be paid to the possibility of Arab insurers making greater use of coinsurance; and (ii) there should be subregional and regional co-operation to provide both the technical expertise and the capacity required for the insurance of large risks which is beyond any single insurance market.

5. A discussion of natural hazards in the Arab World gave an important indication of the demand for market capacity. The main points of the discussion were as follows:

(i) The Arab World has had considerable losses due to natural hazards throughout recorded history.

(ii) Many of the rapidly expanding Arab cities industrial and other developments are located in areas exposed to natural hazards, and are thus of major concern to both insurers and reinsurers, as well as to the government. The need for the assessment of accumulation of risk - through establishing natural hazards zones, loss accumulation and assessment zones - and the demand for catastrophe cover become of paramount importance to insurers and reinsurers in an attempt to control their exposure to catastrophic disasters resulting from natural

hazards.

6. A study was made of the establishment of reinsurance companies and the use of pools as measures for increasing retention capacity, and the following points emerged:

   (i) Where reinsurance companies have been formed, they have increased the national retention capacity, as borne out by study of data over seven years for the Egyptian Re and ten years for Iraq Re. However, although both companies had retained a high proportion of their foreign and domestic business, the outflow of reinsurance premiums abroad was still large. One major criticism may be made of their operational methods, and this concerns the payment of commission to local insurers, which is lower than the rates available on the international reinsurance markets. This has the effect of creating a major constraint on the growth of domestic insurers, and increasing the cost of insurance to policyholders.

   (ii) The formation of Arab reinsurance pools was a much less successful measure in the attempt to increase the amount of retained premium income within the region.

7. International insurance and reinsurance transactions and their effects on the balance of payments was analysed, and it was apparent that the demand for international insurance and reinsurance may result in a large foreign exchange outflow. This depends largely on the size of business transacted, and the profitability of the business. Despite the Iraq Re improving its country's net foreign cash flow on reinsurance trade,

the study of the Iraqi insurance market as a whole, however, showed that reinsurance transactions constantly resulted in a considerable balance of payments deficit during the period 1971-80. Indeed, although this is the case with most countries worldwide (even the USA, the largest country in the world in terms of premium income) one major disaster, particularly in the Third World countries, may bring an inflow of foreign exchange in a single year on a scale far greater than several years' premiums outflows.

8. The different factors relevant to the study of fixing retention limits were discussed. Where possible, empirical studies of the Arab insurance market were included concerning the extent to which factors discussed influenced the determination of retention limits. It was shown that insurers should pay regard to many factors in fixing retention limits and that there is no general empirical method for determining the optimum level of retention. The implication of this is that a careful and objective analysis must be made before decisions are taken on the fixing of retention limits.

9. A survey of the corporate objectives of Arab insurance companies and an analysis of insurers' corporative objectives in relation to retention limits provided an important framework for the study of retention capacity and the demand for international reinsurance. It was shown that retention capacity and thus retained premium income could be affected by overall company objectives and therefore, the determination of retention limits was discussed in terms of their contribution to

overall company objectives and performance. In this way important decision areas were defined and delineated, along with the problems which must be solved in order to achieve a proper inter-relationship between retention limits and company objectives. The conclusion to be drawn was that there is a strong link between retention limits and company objectives. An additional point emerged from the questionnaire findings - companies in the Arab World tend to be orientated towards social objectives, i.e. providing a service for insured clients at a fair price, rather than being motivated solely by profit objectives.

10. Retention limits and retained premium income were described in different forms of reinsurance where each has a specific purpose. It has been shown that the size of retained premium income differs from one type of reinsurance to another. Intuitive reasoning, knowledge of the structure and characteristics of a certain class of insurance, past experience, reinsurance costs, etc., are factors influencing the choice of a particular type of reinsurance, as well as the level of retention of that type. It was indicated that by arranging a proper reinsurance programme, the advantages to the ceding company would be twofold; firstly, the supply of insurance at direct level would be increased, and secondly, the demand for reinsurance would be reduced, thus lessening reinsurance costs.

11. An empirical study of the relationship between retention limits (RL) on the one hand, and retained premium income (RPI), and capital and free reserves (CFR) on the other, was hampered

by the fact that detailed information was only supplied by two Arab insurance companies, though 46 companies did respond to a questionnaire on the subject. The questionnaire findings revealed that 41 per cent of the respondents fixed their RLs with regard to CFRs, 17 per cent to RPI, and 31 per cent to both; only 11 per cent did not relate RLs to either CFRs or RPI. The analysis also centred on comparing these relationships for both Company A and B within the field of fire, marine cargo, and motor business with the 'rule of thumb' limits which revealed that for all classes the companies' RL as a percentage of RPI or CFRs, in general, was either well above or below the 'rule of thumb' limit. For both companies the fact that no specific method was used when relating RL to RPI and CFRs was noted.

13.3 The Contribution to Knowledge

From the study, the contribution to knowledge is as follows:

1. The research provides the first detailed study and analysis of available domestic retention capacity and the demand for international reinsurance in the Arab World;
2. A comparative study is made of the nature and development of the Arab insurance industry and the development as seen in the insurance industries of both other developing and developed countries;
3. The potential risk of different types of natural hazards, and the potential damage to life and major development projects

are examined, discussed, and analysed, and certain information is displayed cartographically;

4. The increasing domestic and regional retention capacity resulting from the establishment of reinsurance companies and pools is presented and evaluated;
5. The effect of insurance and reinsurance transactions on the balance of payments is presented and analysed;
6. The theoretical and practical inter-relationship between RLs and the possible prime objectives of companies is described and discussed;
7. The practical relationships between RLs, RPI, and CFRs are investigated.

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MAJOR NATURAL HAZARDS OF THE ARAB WORLD (EAST)

Lake Nasser

- Shifting sands
- Saline soils and high water table aggressive poor foundation conditions
- High intensity landslide hazard
- River flooding
- Coastal flooding - Inundation by onshore waves, tides and storms
- <5 days/annum with gales

EARTHQUAKE ZONES

- Low exposure
- Moderate "
- High "
- Major recent earthquake

TOWNS AND DEVELOPMENT
PROJECTS IN THE ARAB WORLD (EAST)

Population – Towns
- Over 3 million
- 1 million – 3 million
- 500,000 – 1 million
- 100,000 – 500,000

Refineries
- Capacity over 100,000 barrels per day
- Capacity under 100,000 barrels per day

Petrochemical plants
Oil fields
Sea ports
Major industrial cities

Egypt
Lebanon
Syria
Jordan
Iraq
Saudi Arabia
Kuwait
Qatar
Bahrain
United Arab Emirates
Oman
Sudan
Red Sea
North Yemen
South Yemen
Somalia
Arabian Gulf
Indian Ocean

0 km 400
0 km 60
0 km 40

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- Moderate "
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- Major recent earthquake

Egypt
Lebanon
Syria
Jordan
Iraq
Saudi Arabia
Kuwait
Qatar
United Arab Emirates
Oman
Bahrain
Sudan
Red Sea
North Yemen
South Yemen
Somalia
Arabian Gulf
Indian Ocean
Lake Nasser

0 km 400
0 km 60
0 km 40

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- River flooding
- Coastal flooding - Inundation by onshore waves, tides and storms
- <5 days/annum with gales
- Tsunami floods

EARTHQUAKE ZONES

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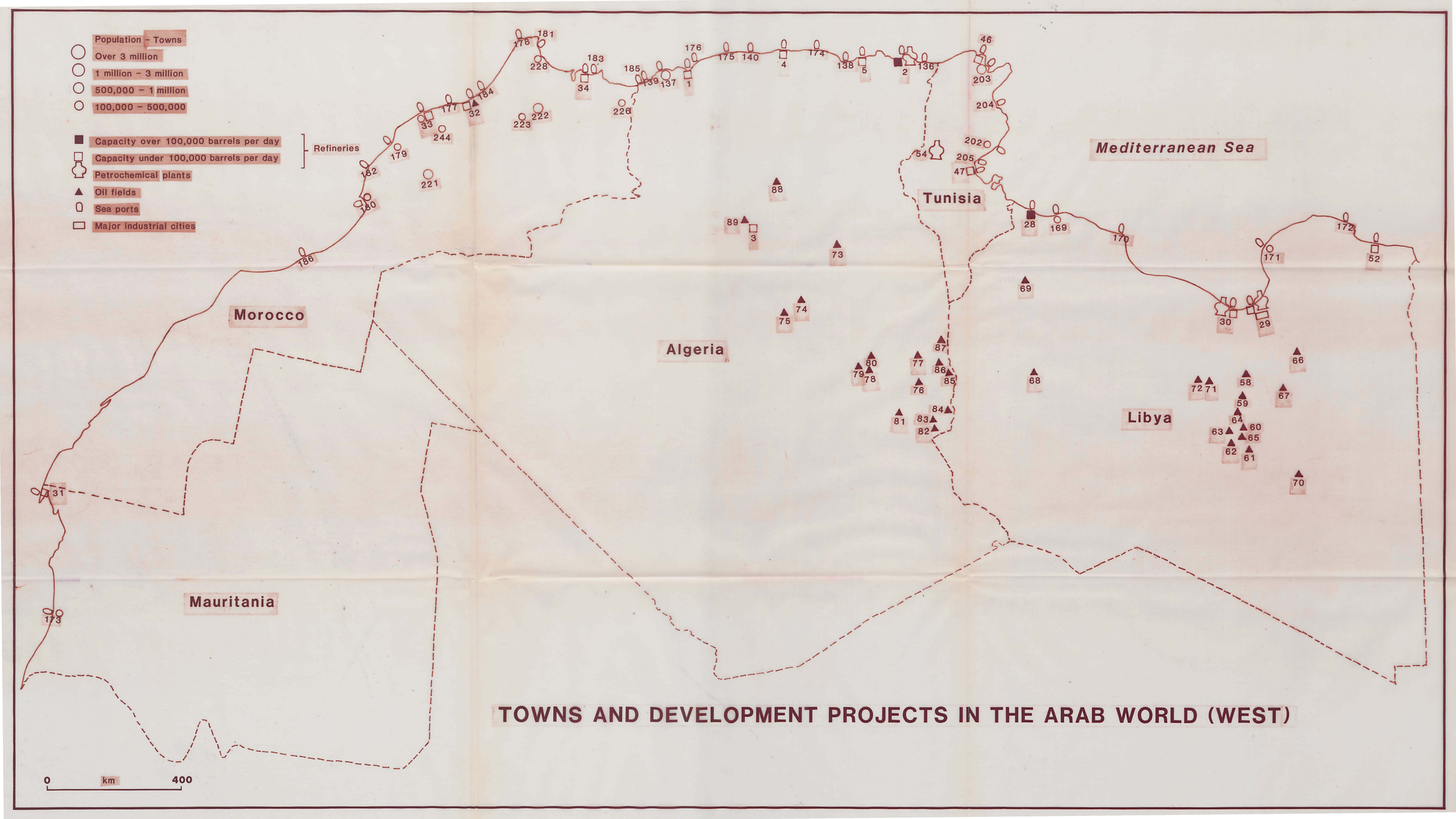

TOWNS AND DEVELOPMENT PROJECTS IN THE ARAB WORLD (WEST)

MAJOR NATURAL HAZARDS OF THE ARAB WORLD (WEST)

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- Coastal flooding - Inundation by onshore waves, tides and storms ≤ 5 days/annum with gales
- Tsunami floods

Refineries
- Capacity over 100,000 barrels per day
- Capacity under 100,000 barrels per day

- Petrochemical plants
- Oil fields
- Sea ports
- Major industrial cities
- Major recent earthquake

EARTHQUAKE INTENSITY
- Moderate
- High

Mediterranean Sea

Morocco

Algeria

Tunisia

Libya

Mauritania

0 km 400

TOWNS AND DEVELOPMENT PROJECTS IN THE ARAB WORLD (WEST)